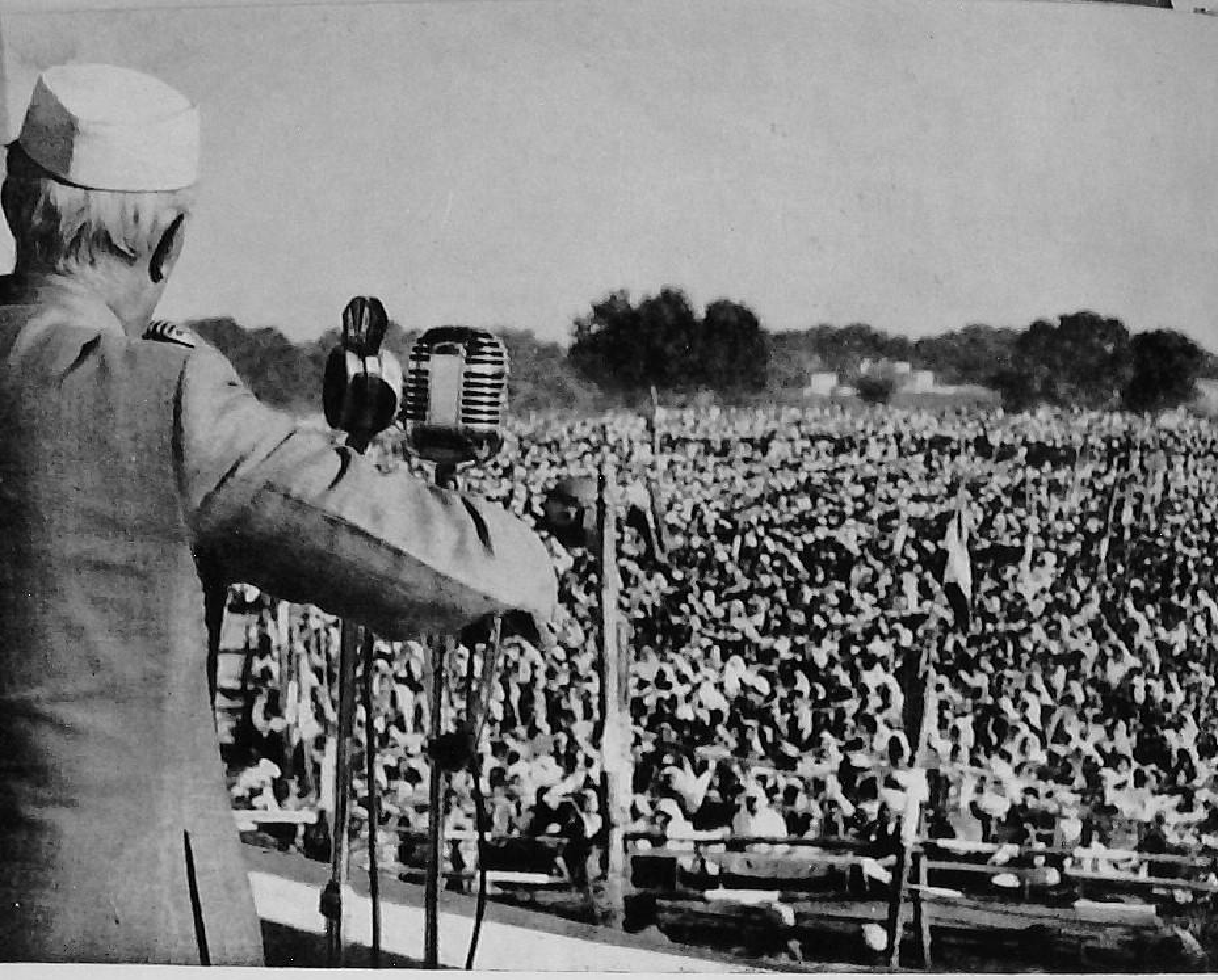
CP81, CB1416 12/3

NATIONAL EXTENSION SERVICE
AND
COMMUNITY PROJECTS
IN
PUNJAB

2004

CD 114/6

NATIONAL EXTENSION SERVICE
AND
COMMUNITY PROJECTS
IN
PUNJAB



All over India we have centres of human activity which are like lamps spreading their light more and more in the surrounding darkness. This light has to grow till it covers the land.

Jawaharlal Nehru

NATIONAL EXTENSION SERVICE

AND

COMMUNITY PROJECTS

IN

PUNJAB

•

By

M. S. RANDHAWA, I.C.S.

Development Commissioner, Punjab

•

Foreword By

SHRI V.T. KRISHNAMACHARI

Deputy Chairman, Planning Commission,
Government of India

•

Community Projects Administration

Punjab Government, Chandigarh

First Edition, August 1955

Printed at National Printing Works, Delhi (India).

To that vast army of men and women
whose silent hard labour is paving way
towards the happier world of tomorrow

FOREWORD

I am glad to write a foreword to Shri M.S. Randhawa's book on "National Extension and Community Projects in Punjab."

The basic principles underlying the National Extension movement and Community Projects are identical. The National Extension movement is permanent. It is expected to cover the whole of India by the end of March 1961. When a National Extension block has done well, judged by the measure of people's co-operation, it is selected for intensive development as a Community Project area for a period of three to four years. Thereafter it reverts to the permanent pattern as a N.E.S. block. The two movements are thus inter-linked. They have common aims and objectives.

Our Prime Minister has called the National Extension movement a "revolutionary movement" and a recent Mission organised by the United Nations has referred to it "as the most significant experiment in economic development and social improvement in Asia at the present time." To understand these remarks, it is necessary for us clearly to appreciate the significance of the movement—its "philosophy."

The people of India are building up a new life for themselves. They are seeking to create a new pattern of society. The National Extension movement is the agency for bringing about this social change in rural India. The aim is that there should be owner-cultivators, making the best use of the land, water, and other resources by scientific agriculture, and finding supplementary occupations in cottage and small-scale industries so that there may be a diversified rural economy and a richer and fuller life. What the movement seeks is to bring about a change in the mental outlook of the people, instilling in them an ambition for higher standards of life and the determination to work for such standards. This is essentially a human problem—how to change the outlook of the 70 million families living in the countryside, arouse enthusiasm in them for new knowledge and new ways of life, and fill them with the will to live a better life.

The objective of the movement is, briefly, to ensure that there are concerted efforts to improve all sides of village life and to mobilise local initiative and resources for the betterment of rural conditions. The basic principles on which it lays stress are three :—

> Firstly, all aspects of rural life are inter-related, and programmes of improvement should be comprehensive, though there might be emphasis on groups of activities. Secondly, the motive force for improvement should come from the people themselves. The movement is built up on the principle of self-help : the State only assists with supplies and services and credit. The vast

> un-utilised energy lying dormant in the countryside should be harnessed for constructive work, every family devoting its time not only for carrying out its own programmes but also for the benefit of the community. Thirdly, the co-operative principle should be applied for solving all problems of rural life.

In my talks to Development Commissioners and others connected with the movement, I have often indicated broadly the directions in which change in outlook is needed and is to be worked for. These are:—

> Firstly, increased employment and increased production by the application of scientific methods in agriculture, including horticulture, animal husbandry, fisheries etc., and the establishment of subsidiary and cottage industries ;
>
> secondly, self-help and self-reliance and the largest extension of the principle of co-operation ; and
>
> thirdly, the need for devoting a portion of the un-utilised time and energy in the countryside for the benefit of the community as a whole.

I should at this stage emphasise another point. The movement is *not* an official movement. There is an administrative organisation for it. This, of course, is necessary and consists of officers at all levels working as a team. But it is more than that. Alongside the administrative organisation, the N.E.S. programme aims at the closest co-operation with the best non-official leadership at every stage. In essence the organisation is both official and non-official ; both have to work together. Development programmes are drawn up after the fullest discussions with the people and their representatives at various levels. In the village, the Panchayat is utilised in the planning as well as the implementation of the programme. Plans drawn up by the village are considered by Advisory Committees at the block level and the district level on which non-official leaders are associated. Thus, at every stage the official and non-official organisations work side by side for evolving and implementing programmes. The whole movement is based on self-help, and the active interest and support of the people has, therefore, to be enlisted in the task of bettering their own condition. The Central Government is assisting the movement by giving a permanent grant of half the additional cost of the staffs and by organising through the co-operative movement and other channels the short, medium and long-term credit required. The movement is thus essentially a peoples' movement. It should not be allowed to deteriorate into an agency for carrying out a series of official projects or schemes but should continue to be a dynamic movement representing the efforts made by the people to improve their own condition. The role of the official is to guide ; to advise regarding the technical and other measures for increasing production ; and to organise the finance, supplies and services needed. In all other matters the responsibility and initiative should be with the people themselves.

How is the success of the movement to be judged? What are the criteria for the assessment of results and for gauging the extent to which the movement has brought about a change in the minds of the people? In my view, the following should be the tests:—

Firstly, have we given a plan of improvement to every family, and are we assisting these families to implement their plans? To achieve the target of doubling the production in ten years, works of permanent improvement have to be initiated by every family for making the optimum use of irrigation facilities, for consolidation of holdings, for contour-bunding etc. The aim should be increased employment not merely in agriculture but also in cottage and small-scale industries etc.

Secondly, is every family made fit to become a member of at least one co-operative society in its own right? The co-operative system should be integrated with the National Extension movement. The important question is how the sections of the community which are not represented on co-operative societies for the reason that they do not satisfy the tests laid down for credit-worthiness can be rehabilitated and made creditworthy. Unless such rehabilitation is achieved, the movement will be condemned as benefiting only the well-to-do families and cannot become a people's movement in a real sense.

Thirdly, to what extent do the families utilise a portion of their time for voluntary work for the benefit of the community? The aim should be to have *permanent* works of public benefit—like village forests, improvement of grazing grounds, drinking water wells, roads, school buildings etc.—constructed with people's participation. It should also be emphasised that such works as are constructed should be maintained by the village community.

Fourthly, is there an active women's and youth movement in the villages? It is most important to bring the women and the youth into the movement fully. Only so can its usefulness be maintained.

Unless these four questions can be answered in the affirmative for practically every rural family, the objective of the movement cannot be said to be fully achieved. Briefly, the aim is to bring about a social change—an awakening in the countryside—and to release the dormant energies of the nation for the achievement of a fuller and richer life. It is by the extent to which this social change is brought about that the movement has to be judged.

The movement has taken shape from the experience gained in several parts of the country in the working of intensive schemes of rural welfare. The organization is not to be rigid. Changes in it should be made as they are found necessary from time to time.

Similarly, the programmes should be adjusted to meet the essential needs of individual areas.

Speaking the other day about this movement, I said:—

> "It is based on the dignity and worth of the individual. Its main idea is to bring about a change in the outlook of the millions of families in the countryside, and to assist them in their efforts to build up a new life. The foundations are thus being laid for the Welfare State in action which will cover the whole country by 1961. A pattern of social and economic life has been placed before the country which it will be the aim of the Welfare State to bring into existence. There are instances of communities organising themselves on this pattern: but nowhere has the experiment been tried for a vast rural population like ours and in an under-developed economy with so many intractable problems. The results so far obtained have been on the whole encouraging; and as the administration and non-official leaders gain more and more experience, there are grounds for the hope that the movement will gather momentum. What is essential is that the movement, basing itself on the application of the principles of self-help and co-operation, should always retain its vigour and dynamism, and adapt itself speedily to the new demands and new situations that will arise."

Here is an exciting adventure in which all can share who seek opportunities for social service.

I have said all this before on many occasions but repeat the remarks here as it is most important that the fundamental characteristics and the spirit of the movement should be clearly understood.

I congratulate Shri Randhawa on this excellent book. In writing it, he has drawn freely on his intimate knowledge and experience of the movement in the State of Punjab and elsewhere. I have no doubt that the book will be found very useful not only by officials and non-officials connected with the movement in the Punjab State, but also by workers in other parts of India.

New Delhi,
4th August, 1955

V.T. Krishnamachari
Deputy Chairman
Planning Commission
Government of India

PREFACE

Need for a hand-book on Community Development work for the guidance of the field staff has been felt since Community Projects Development work was started in October, 1952. Since then the tempo of work has been accelerated under the National Extension Scheme, and already 46 Blocks, which cover one fourth area of the State, are under the development programme. During the Second Five-Year Plan the entire rural area of the Punjab would be covered by Development Blocks under the National Extension Service. As such, need for a hand-book, which should contain information of practical value for the guidance of the administrative officers, is very great.

The objectives of the Community Development Programme are out-lined in this publication, and information is given for preparing programmes of work as well as for extension work in the rural area. Information is given as to how the work should be organised and schemes formulated. Hints are given to show how campaigns, drives and weeks should be organised to increase the tempo of work, and what incentives and awards should be given to the staff engaged in development work. Guidance is also provided regarding the bases on which targets should be fixed and how people's participation should be secured. Organisation of youth camps has become a major activity under the Development Programme, and practical hints are given regarding the organisation of students camps. The large-scale operation of Consolidation of Holdings, which has provided scope for rural development on a vast scale, is also described. This would be of particular value to other States in the country. The work done by the people in building roads is briefly described. Schools are springing up in large numbers in the community projects and N.E.S. Blocks, and emphasis is laid on the system of basic education. The educational programme with special reference to basic education is described. Village industries will only receive impetus when the large-scale programme of rural electrification is implemented. However, a modest beginning has already been made and industries which are

being encouraged are mentioned. Considerable emphasis is laid in Community Projects Programme on health services, environmental sanitation and improved nutrition. Practical hints are given regarding the building of latrines and urinals, and paving of streets. Deficiencies in the diet of the farmer are also mentioned. In the chapter dealing with agriculture an account of improved varieties of crops, fertilizers and improved implements is given. The major fruit crops are described and cultural hints given in the chapter on Horticulture. Information is given about *berseem* and vegetable cultivation. Very useful information has been provided regarding cattle, buffaloes, dairying, goat and sheep rearing, fishbreeding poultry, and bee-keeping. An account is also given of the two Seminars on Social Education. A chapter on Community Centre is included to emphasise the importance of this institution. Community festivals, which were organised on a large scale in the Punjab, are also described. Hints are given about organising children's parks so that they also benefit in full measure from the Development Programme.

The keen interest taken by Shri Bhim Sen Sachar, Chief Minister, Punjab, in the Community Development work has been a source of inspiration and unfailing encouragement.

It was mainly on account of the encouragement given by S. Partap Singh Kairon, Development Minister, Punjab, that this work was undertaken by the author in the midst of heavy office work, and I acknowledge his help and support very gratefully.

I also gratefully acknowledge the help which Mr. Prem Nath has given in compiling this hand book. Mr. H.R. Saini, Director of Agriculture, provided useful information on Agriculture, Horticulture and Bee-keeping ; Mr. B.N. Handa, Director of Animal Husbandry and Warden of Fisheries has provided information of great practical value on the subjects relating to him, and Dr. D. Anand, Health Educator, has provided useful material on Health Services and Environmental Sanitation. I am grateful to Shri Krishan Chand, I.C.S., Deputy Secretary, Community Projects Administration, Government of India, for carefully reading the manuscript and suggesting useful amendments. I would also like to mention that the literature produced by the Community Projects Administration, Government of India, has been of great help, and has been freely

made use of wherever necessary. The contribution which Mr. H.K. Gorkha, Photographer of the Community Projects, Punjab, has made by providing a number of significant photographs is particularly worthy of mention. The maps and line sketches were provided by Mr. Madhusudan Joshi, Artist of the Community Projects.

It is hoped that this publication will be of considerable practical help to the workers, who are administering the Community Projects and National Extension Scheme Development Programme.

M.S. RANDHAWA
Development Commissioner
Punjab

Chandigarh,
10th March, 1955

CONTENTS

Pages

I. PROGRAMME AND ADMINISTRATION

CHAPTER 1

Community Development Programme

Two Pioneers—Rural Development in U.P.—Community Projects Programme 1952—Ford Foundation Pilot Extension Training Centres—Community Projects in Punjab—Aided Self-Help Programme—Multi-purpose Programme—Emphasis on Agriculture—The Community—Harmonising the Country and the Town .. .. .. 1—11

CHAPTER 2

Organisation, Programming and Extension

Village Development Councils—Village Extension Work—Programming—Local Planning—Technique of Administration .. .. 12—20

CHAPTER 3

Schemes and Budgets

Preparation of Schematic Budgets and Programmes—Preparation and Sanction of Schemes (Other than Works)—Irrigation—Reclamation—Health—Rural Housing—Education—Social Education—Communications—Rural Arts, Crafts, and Cottage Industries—Purchase of Equipment—Amount Sanctioned .. .. 21—30

CHAPTER 4

Campaigns, Drives, Incentives and Awards

Pohli Eradication Campaign—Campaign for Distribution of Fertilisers—Tree Planting Campaign—Campaign for Road Making and Digging of Drains—Incentives and Awards .. .. .. 31—33

CHAPTER 5

Community Development Areas

Batala Project—Nawanshahr Project—Jagadhri Project—Fardidabad Project—Sonepat Project—Nilokheri Block—Naraingarh Block—Thanesar Block—Tarn Taran Block—Kulu Project .. .. .. 34—53

CHAPTER 6

Problems of Hill Areas

Horticulture—Agriculture—Animal Husbandry—Cottage Industries—Social Education—Environmental Hygiene—Health—Campaigns against Diseases .. .. 54—58

CHAPTER 7

Targets

Reclamation of Land—Distribution of Fertilizers—Distribution of Improved Seeds—Line-sowing of Cotton—Japanese Method of Rice Cultivation—Distribution of Improved Implements—Compost Pits—Plantation of Trees—Model Farms—Demonstration Plots—Percolation Wells and Tubewells—Veterinary First-aid Centres—Veterinary Dispensaries—Artificial Insemination Centres—Supply of Pedigree Bulls—Supply of Improved Poultry Birds—Supply of Eggs for Hatching—Ponds Stocked with Fish—New Hospitals and Dispensaries—First-aid Centres—Maternity and Child Welfare Centres—Dais to be Trained—Drains, Streets, Wells and Latrines—Kacha Roads—Pacca Roads—Schools—Adult Literacy Centres—Community Centres—Reading Rooms—Community Radio Sets—Women's Organisations—Children's Parks—Young Farmers' Clubs—Cooperative Societies .. .. .. 59—63

II. PEOPLE AND THE PROGRAMME

CHAPTER 8

People's Participation in Community Work

Minimum Standards—Peoples' Contribution .. .. 67—70

CHAPTER 9

Students' And Youth Camps

Categories of Camps—Age and Education of Participants—Financial Assistance—Strength—Essential Features—Certificates to Campers—Students' Camps in Punjab .. .. 71—75

III. CONSOLIDATION OF HOLDINGS

CHAPTER 10

Consolidation of Holdings Scheme

Disadvantages of Fragmented and Scattered Holdings—Consolidation of Holdings under the Cooperative Department in Joint Punjab—The New Act—The Revised Scheme of 1952—How a Village is Consolidated—Advisory Committee—Valuation—Killabandi—Reservation of Land for the Community—Publication of Scheme—Pass Book—Repartition—Road Plans—Home-steading—Checking of Corruption—Progress of Work .. .. 79—87

IV. COMMUNICATIONS

CHAPTER 11

People's Roads

Programme of Work—Nawanshahr—Sonepat—Jagadhri—Batala—Faridabad—Nilokheri—Naraingarh—Kulu—Tarn Taran .. .. 91—95

V. EDUCATION

CHAPTER 12

Education

Outline of Plan—Basic Education—Adult Literacy—Targets and Budget Allocations .. .. 99—105

VI. INDUSTRIES

CHAPTER 13

Village Industries and Industrial Training

State Assistance—Technological Institute—Industrial Cooperatives and Emporia and Marketing — Industrial Training — Training Centres .. .. 109—113

VII. RURAL HOUSING, HEALTH AND SANITATION

CHAPTER 14

Rural Housing Schemes

Demolished Evacuee Villages—Type Designs of Layouts—Organisation of Model Villages—Community Buildings—Streets, Foot-paths, and Cattle Tracks —Completion Plan .. .. 117—123

CHAPTER 15

Health Services

Maternity and Child Welfare Work—Health Education—Targets .. 124—126

CHAPTER 16

Environmental Sanitation

Extent of Damage, Eradication of Fly-breeding—Fly Control by Sanitation—Latrines for Rural Area—Wardha Conservancy System—Utility Urinal—Paving of Streets—Parapetting of Wells—Plantains for Soaking Waste Water .. .. 127—135

CHAPTER 17

Nutrition

Diet of Punjabi Farmer—Deficiency Diseases—Goitre—Anaemia—Pellagra—Mixed Diet—Vitamins—Calcium and Iron—Rice, Wheat and Milk .. .. 136—139

VIII. AGRICULTURE

CHAPTER 18

Improved Crops

Adoption of Improved Varieties of Crops—Varieties of Seeds suited or Cultivation in Plains .. .. 143—145

CD114/6

CHAPTER 19

Fertilizers and Manures

Artificial Fertilizers—Preparation of Compost Manure—Yields and Manuring—Scope of Increasing Crop Production by Utilization of Human Manure and Wastes—Poor Use of Organic Manure—Its Reasons—Hints for Improving Farm Yard Manure—Preparation of Compost Manure in Trenches .. .. 146—156

CHAPTER 20

Japanese Method of Paddy Cultivation 157—158

CHAPTER 21

Improved Implements 159—160

CHAPTER 22

Vegetable Gardening

Croping Scheme—Cole Crops—Root Crops—Bulb Crops—Leguminous Crops—Leafy Vegetables .. .. .. 161—168

CHAPTER 23

Summer Vegetables

Solanaceous Fruits—Vine Crops .. .. .. 169—177

CHAPTER 24

Fodder (Berseem)

Soil—Sowing and Seed Rate—Time of Cutting—Seed Production .. 178—181

IX. HORTICULTURE

CHAPTER 25

Horticulture

Site—Climate and Soil—Preparation of Land—Method of Planting

—Distance of Planting—Selection of Plants—Planting Season—Varieties Recommended for Planting— Irrigation—Manuring .. .. 185—191

CHAPTER 26

Garden Colonies

Value of Fruit in Diet—Climate of Punjab—Horticultural Regions—Irrigation—Selection of Garden Colonists—Consolidation of Land—Demarcation of Layouts—Allotment of Plots—Cooperative Management—Nurseries—Interculture—Finances—Subsidiary Occupations and Industries .. .. 192—207

X. ANIMAL HUSBANDRY

CHAPTER 27

Cattle

Breeding of Cattle—Non-descript Cattle—Breeding—Sources of Supply—Artificial Insemination—Mating—Calving—Feeding—Housing—Milking—Castration—Protection of Cattle against Contagious Diseases—Breeding Policy—Cattle Fairs and Shows and Marketing of Cattle .. 211—219

CHAPTER 28

Buffaloes

Breeds—Mating and Calving—Feeding—Housing, Care and Management—Milking—Protection against Contagious Diseases—Registration and Milk Recording .. .. 220—223

CHAPTER 29

Dairying 224—227

CHAPTER 30

Goat

Breeds—Goat Husbandry—Breeding Operations .. .. 228—231

CHAPTER 31

Sheep

Sheep Husbandry—Breeds and Breeders—Mating Seasons—Breeding Operations—Lambing—Clipping Seasons—Dipping—Feeding—Source of Stud Rams—Cross Breeding in Sheep—Cross Breeding Operations—Castrations—Wool Industry—Wool Markets in Punjab .. 232—237

CHAPTER 32

Fisheries

Important Species in Punjab—Best Varieties of Fishes—Schemes of Pisciculture—Suitability of Waters—Production and Disposal of Fish—Targets—Useful Instructions—Precautions—Fry Trade .. .. 238—241

CHAPTER 33

Poultry

Departmental Organisation—Selection of Site—Selection of Breed—Selection of Birds for Breeding—Production of Matching Eggs—Incubation—Best Period for Matching—Breeding—Rearing of Young-stock—Housing-Nests—Feeding—Feeding for Egg Production—Care of Eggs—Preservation of Eggs——Disease Control .. .. .. 242—250

CHAPTER 34

Bee-keeping

Importance of Bye-products—How to Make a Start—Which Bees to keep—Where to keep Bees—Modern Beehive and Other Bee Appliances—Management—Profit in Bee-keeping—Technical and Other Facilities .. .. 251—256

XI. SOCIAL EDUCATION

CHAPTER 35

Brightening the Villages

Mechanised Farming—Rural Electrification—Need of a New Education Policy—Rural Artisans—Libraries and Reading Rooms—Games—Folk Songs—Folk Dances—Baghs and Phulkaries .. 259—271

CHAPTER 36

Community Centre
(Panchayat-Ghar)

Panchayat and Village Development Council (Vikas Mandal)—Panchayat-ghar—Libraries—Night Schools—Poultry—Nurseries—Games 272—275

CHAPTER 37

Community Festivals

Planning of Melas—The Round Starts—Sonepat Mela—Nawanshahr Mela—Faridabad Mela—Jagadhri Mela—Nilokheri Mela—Batala Mela—Retrospect and Prospect .. .. 276—281

CHAPTER 38

Children's Organisations (Bal Sabhas)

Objectives of Child Welfare Programme—Preparing the Programme 282—285

CHAPTER 39

Social Education

Community Centre—Duties of Sociol Education Organizers—Seminars on Social Education—Implementation of Recommendations Made at the First Seminar on Social Education held at Nilokheri .. 286—303

ILLUSTRATIONS

(Facing)

1. Shri Jawaharlal Nehru addressing a public meeting at Naura, Nawanshahr Community Project .. .. .. Frontispiece
2. Development areas in Punjab 34
3. Tea gardens in National Extension Service Block, Palampur 54
4. Building roads in the hills is an arduous job .. 54
5. Smokeless stove with chimney, now being popularised in hill areas 55
6. People's participation 68
7. Members of a Student's Camp 69
8. Students working with villagers 69
9. Map of village Ghungrali before consolidation .. 80
10. Map of village Ghungrali after consolidation .. 81
11. New roads spring up 92
12. Building village approach roads 92
13. Suggestive Plans for Primary and Middle Schools .. 100
14. A training class at work 110
15. Way to economic freedom for women 110
16. Learning Calico Printing in an Industrial School .. 111
17. A Social Education Organizer teaching embroidery to village women 111
18. Model village Gujjarpur in Nawanshahr Project .. 118
19. A neat and compact Community Centre .. 118
20. Aesthetics of a village house-wife 119
21. A neat village kitchen 119
22. Design for a smokeless kitchen 124
23. The usual village lanes 127
24. Paved streets and drains give new look to villages .. 127
25. Model Latrine (Kharar) 130
26. Soakage pit 131
27. Utility urinal 132
28. Funnel urine-pit 133

29. An old unhygienic well 134
30. Nicely built new wells are replacing old wells .. 134
31. A model well which even a man can work unaided .. 135
32. A simple sanitary well 135
33. C591 Wheat 144
34. Sowing paddy by Japanese Method 145
35. A rich rice field 145
36. Preparing straw bed for cattle 146
37. Good manure is ready 146
38. Compost pits 146
39. Cycle of matter, Organic and Inorganic nutrients in soil 148
40. A tubewell 159
41. Electric chaff-cutter which automatically removes dust from fodder 160
42. Pumping sets are eliminating drudgery of drawing water from wells 160
43. A simple machine for rope-making 161
44. A new chaff-cutter 161
45. A model tree plantation plan, for a small farm .. 186
46. Oranges are popular in Punjab 192
47. Citrus plantation in a garden colony 193
48. Hissar cow 212
49. Hissar bull 212
50. Hariana cow 213
51. Hariana bull 213
52. A herd of Hissar breed cows 214
53. Government dairy farm, Chandigarh 214
54. Sahiwal cow 215
55. Sahiwal bull 215
56. Treating animals for foot diseases 216
57. A well-equipped laboratory at the Government Dairy Farm, Hissar 216
58. Murrah buffalo 220
59. Murrah bull 220
60. Beetal goats 228
61. Beetal bucks 229
62. Hissar-dale sheep 232
63. A flock of Hissar-dale sheep 232

64. Bikaneri sheep 233
65. Lohi sheep 234
66. A flock of Lohi sheep 234
67. Trouts from the Government Fisheries, Katrain .. 238
68. The brooder 242
69. Inoculation of poultry in community areas .. 242
70. White Leg-horns 243
71. The foster mother 243
72. A new model of wall-hive 252
73. Honey is ready for the market 252
74. Two-storey Langstroth Hive 254
75. Two-storey Langstroth Hive showing arrangement of parts 255
76. Joy that must come back to villages 260
77. A project library 265
78. Reading rooms spring up in villages 265
79. Piping songs of innocence 269
80. A hill folk-singer 269
81. Children's parks spring up in Community areas .. 282
82. Children playing kabaddi 282
83. See-saws are very popular in children's parks .. 283
84. No boredom for them now 283
85. Learning to spin in the Bal-sabha 284
86. One of the regular medical check-ups of children .. 284
87. A dai training class 286

I

PROGRAMME AND ADMINISTRATION

CHAPTER 1

COMMUNITY DEVELOPMENT PROGRAMME

India is the land of villages, and it is well known that its population is predominantly rural. In spite of the rural population being something like 85% of the total, villages had been neglected in the context of development programme of the country. In fact there was no planned development either for the cities or for the rural areas. But towns got more attention because law and order had to be maintained, taxes had to be collected, and the population which was concentrated in the cities for reason of these being headquarters of administration where Police Stations, Tehsil offices, District Courts and other offices as nerve-centres of the Government existed had to have elementary necessities satisfied. The education system also tended to draw the leadership from the villages to towns as educational facilities were available largely in the latter. The result in short was that villages were neglected and towns flourished at the expense of village economy.

Two Pioneers

Government officials who interested themselves in rural development were regarded as faddists, and they were permitted to function only within certain limits. One of such unusual persons among the officials was Mr. F. L. Brayne. He started an experiment of rural development work on a fairly extensive scale in Gurgaon district where he was posted as Deputy Commissioner in 1928. He overcame the difficulty of finance by utilising District Board funds for the purposes of his programme. Considerable enthusiasm was raised, and many improvements were introduced in the villages of Gurgaon. The main emphasis was on manure pits, ventilators, improved agricultural implements, and education of women. However, the weakness of the programme lay in the fact that the initiative came entirely from the top, and people's active participation was not secured. As a result, most of the work came to a stand-still after the transfer of Mr. Brayne from Gurgaon. However, his achievement lies in the fact that he brought the village problem into prominence, and set people thinking.

On the people's side Mahatma Gandhi took the initiative. Apart from taking the message of freedom to the villagers in their homes, Mahatma Gandhi devoted attention to the social and economic problems of the village. On the social side he laid emphasis on the abolition of untouchability. He also interested himself in the revival of cottage industries. He realised that the spare time of the villagers must be usefully spent. It was on this account that he laid so much emphasis on cottage spinning with the aid of *charkha*, and wearing of hand-spun cloth. On the social side he realised that caste system, which had relegated permanently a section of the community to a type of work unworthy of human dignity was in need of radical change. In *Ashrams* which are named after him, stress was laid on practical abolition of caste by encouraging inter-dining and working together. Thus tanning of leather in these Ashrams was done by Brahmins and Rajputs along with Chamars.

Rural Development in U.P.

An ambitious programme of rural development was launched in U.P. from 1937 to 1939 under the guidance of the Development Minister, Dr. K. N. Katju. Mr. M. D. Chaturvedi, Rural Development Officer, in collaboration with the author initiated a number of new experiments. The institution known as Panchayat Ghar was evolved, and the concept of a new organisation, which has now fructified in Community Projects and National Extension Scheme, was also outlined. It was for the first time that it was realised that excessive departmentalisation and overlapping in Departments, which dealt with the villager and his problems, required attention. It was felt that to deal with the simple needs of the villager there was need of a co-ordinated approach and effort, and that instead of having too many officials at the village level there should be a single friend, philosopher, and guide who could deal with his problems on the spot, and offer simple practical solutions. It was thus that the concept of the Village Level Worker came into being. The need of co-ordination in the administrative machinery at various levels was felt, and it was proposed that the District Officer as District Development Officer should bring it about at district level, and the Development Commissioner at the State level.

Community Project Programme 1952

On account of the partition of India 8 million persons migrated from Pakistan. Consequently from the last quarter of 1947 to 1951 Government of India had to face the immense problem of rehabilitating these refugees. By 1951 the problem of rehabilitation of refugees was largely solved at least in Northern India. Government of India could now pay attention to the problems of the villages. Shri Jawahar Lal Nehru, Prime Minister of India, following in the footsteps of Mahatma Gandhi, turned to the villages in July, 1952, in a new effort to galvanise national economy. This is a landmark in the history of India, as it was for the first time that Government showed determination to tackle the rural problem in all its aspects undaunted by its magnitude. For the first time the village became important, and the villager acquired self-respect. The lime-light of the press and publicity was switched on to the village, and the villager so far despised and neglected, suddenly became the object of regard and sympathy. Officials and public men from the middle classes felt honoured in working with the villagers in building their roads and cleaning their streets.

Ford Foundation Pilot Extension Training Centres

In 1951 the most pressing problem was that of food shortages. These were due to the fact that apart from droughts, areas with surplus agricultural production had gone over to Pakistan as a result of the partition. Purchases of food-grains from abroad were straining the resources of India, which were needed badly for internal economic development. The experiments in "extension" which had been carried on at Etawah in U.P. under the guidance of Mr. Albert Meyer showed that the problem of agricultural extension could be handled in an organised manner on a large scale. With the financial aid provided by the Ford Foundation, 15 pilot projects were launched. 34 Training Centres for training multi-purpose village extension workers were set up. In the Punjab these training centres were located at Batala and Nilokheri.

Community Projects in Punjab

The Community Project Blocks came into being in 1952 as a result of the Indo-U.S. Operational Agreement No. 8. Five Community Projects were started in Batala, Nawanshahr, Jagadhri, Faridabad, and Sonepat tehsils, and a Community Project Block around Nilokheri in October, 1952. Community Project Blocks were started in

October, 1953 in Kulu, Tarn Taran, Naraingarh, and Thanesar.

Aided Self-help Programme

The Community Development Programme has been described as "aided self-help programme." The State and the people have become partners in a gigantic common enterprise for transforming the rural area, and for liquidating a vast rural slum, the inheritance of centuries of inertia. While the State provides part of the finance, and technical know-how, the people provide land, money, and labour. A number of minor projects in villages, which were held up due to lack of finance, are now making headway on account of the financial aid provided by Government. The success of the programme is judged by the response it evokes among the villagers, and the extent to which the people participate in the project work. Its principal objective is to transform the social and economic life of the villages.

Multi-purpose Programme

Community Development Programme is a multipurpose programme, touching rural life in all its aspects, economic, social, and cultural. Rural life is an organic whole, and no improvement in any sector is possible unless an attack is made on all sectors simultaneously. While facilities are provided to the farmers for growing improved crops, for rearing better cattle and poultry, and for improving cottage industries, attention is also paid to environmental hygiene. The village must have paved streets, pacca drains, parapetted wells equipped with soakage pits, and suitable latrines and urinals, so that the villagers live in clean and healthy environment. The problem of diet is important. The farmer's diet must be nutritious as well as balanced with adequate quantities of protective foods, such as milk, eggs, fruit, and vegetables. All these improvements would be possible only if the farmer raises more income from the land by reclaiming waste-land, by developing means of irrigation, by sinking wells and tubewells where they are possible, by adopting the use of fertilisers and improved seed, by sowing seed in rows, by the cultivation of fruits and vegetables, and by adopting poultry farming and animal husbandry as side lines. In short, it is 'Mixed Farming' which is suggested as the ideal.

The main items in the programme are detailed below:

(*a*) **Agriculture and allied fields**

(*i*) Reclamation of available virgin and waste land;

CD 122

(*ii*) Provision of water for agriculture through canals, and tubewells, surface wells, and tanks, lift irrigation and from rivers, lakes, pools, etc ;

(*iii*) Provision of quality seeds ;

(*iv*) Provision of improved agricultural techniques ;

(*v*) Provision of veterinary aid ;

(*vi*) Provision of improved agricultural implements ;

(*vii*) Provision of marketing and credit facilities ;

(*viii*) Provision of breeding centres for animal husbandry ;

(*ix*) Development of inland fisheries ;

(*x*) Reorganisation of dietetics ;

(*xi*) Development of fruit and vegetable cultivation ;

(*xii*) Soil research and provision of manures ;

(*xiii*) Provision of arboriculture including planting of forests ;

(*xiv*) Provision for the assessment of results.

(*b*) **Communications**

(*i*) Provision of roads ;

(*ii*) Encouragement of mechanical road transport services ;

(*iii*) Development of animal transport.

(*c*) **Education**

(*i*) Provision of compulsory and free education at the elementary stage ;

(*ii*) Provision of High and Middle Schools ;

(*iii*) Provision of social education and library services.

(*d*) **Health**

(*i*) Provision of sanitation and Public Health amenities ;

(*ii*) Provision of medical aid for the ailing ;

(*iii*) Pre-natal and ante-natal care of expectant mothers ;

(*iv*) Provision of midwifery services.

(*e*) **Training**

(*i*) Refresher courses for improving the standard of existing artisans ;

(*ii*) Training of agriculturists ;

(*iii*) Training of extension assistants ;

(*iv*) Training of supervisors ;

(*v*) Training of artisans ;

(*vi*) Training of managerial personnel ;

(*vii*) Training of health workers ;

(*viii*) Training of Executive officers for Projects.

(*f*) **Employment**

(*i*) Encouragement of cottage industries and crafts as main or subsidiary occupations ;

(*ii*) Encouragement of medium and small-scale industries to employ surplus hands, for local needs or for export outside project areas ;

(*iii*) Encouragement of employment through planned distribution, trades, auxiliary and welfare services.

(*g*) **Housing**

(*i*) Provision of improved techniques and designs for rural housing ;

(*ii*) Provision of housing in urban areas.

(*h*) **Social Welfare**

(*i*) Provision of community entertainment, based on local talent and culture ;

(*ii*) Provision of audio-visual aid for instruction and recreation ;

(*iii*) Organisation of local and other sports activities ;

(*iv*) Organisation of melas ;

(*v*) Organisation of co-operative and self-help movements.

Emphasis on Agriculture

The main emphasis, however, in the Community Projects Programme is on agriculture. Productivity of land in India is proverbially low. If means of irrigation are developed and the use of manures and fertilisers encouraged, productivity can be appreciably increased. India has been spending Rs. 300 crores per year in foreign exchange to buy foodgrains. By producing more foodgrains all money can be saved and utilised for other development works. Thus the importance of

agriculture in the Community Projects Programme cannot be over-emphasised. But the Community Projects Programme is more than a method of getting greater yields. As Mr. Wilson states: "It is an organised method of applying a mass of available knowledge to community betterment, yet a method that recognises primarily and constantly the all important part of the villager in the Plan. Only as this is recognised by the villagers themselves—as well as the workers—can enthusiasm, self-help and a genuine peoples' participation be obtained. Only in this way will community development make the success that is possible for it."

Attention is also paid to education, for mass education is the key-stone of the arch of rural development, and without educating the villagers no programme of development can be usefully implemented. Woman runs the home, and if she is illiterate progressive ideas cannot spread. Hence, women's education occupies an important place in Community development.

Material and spiritual development must go side by side. Mere material progress with clean houses and streets will not spell progress. Ultimately it is the spirit of man which counts. Enthusiasm must be raised by propaganda. The cultural heritage of the people in the shape of folk-art, folk-songs, and folk-dances must be revived. This aspect of rural life is dealt with under Social Education in the Community Development Scheme. The ultimate ideal is to awaken the urge for better living and for a fuller and richer life among the villagers. As Mr. S. K. Dey says: "The motto of Community Projects is 'Destination Man.'" The project will succeed to the extent it can approach this target. It will fail to the extent it leaves "Man" behind and attempts to push things alone to the fore. Man comes into being through joy and love. Man grows to his stature through the sweat of his muscles, man reaches his consummation through realisation—physical, mental and spiritual."

The objective of Community Development Programme is not to dig a pond, which would ultimately stagnate, but to expose the springs of life, so that there is a perennial flow of pure and sparkling water and a cycle of activity gets started and the vicious circle of poverty and unemployment is ended.

What is the 'Community'? It is thus that Mr. S. K. Dey, answers the question: "A community is distinguished from the crowd in our society today, identically by the same features as distinguish an orchard from a jungle. A jungle is a conglomeration of vegetation developed on *laissez faire* economy, conforming to the aboriginal laws of nature, red in teeth and claws. The jungle contains all varieties of vegetation, from the poisonous weeds to the fruit plants, each trying to elbow out the other for space and all ultimately arriving at a natural compromise determined by the vagaries of the soil and weather. The orchard on the other hand is a carefully ordered jungle in the hand of a master artist who provides room for all growing to full blossom, each in its own place complementing each other in the dance of the cosmos. "Live and let live," with opportunity for growth, each according to its capacity, is the moral mandate. A community of people will have to be guided by the same basic principles as apply to the orchard, and the master artist will have to apply his tools in the same pattern."

The Community

Thus the object of Community Project Programme is to create order out of confusion, and to evolve a harmonious unit out of the rural population whose energies should be harnessed in performing tasks which they can easily achieve without any cost.

Harmonising the Country and the Town

The ultimate aim of rural development schemes, which are launched under the Community Projects, is to narrow the gap between the town and the country. The ideal is to urbanise the rural areas, and to ruralise the urban areas. While the amenities which modern science has developed in the form of metalled roads, electricity, schools, and hospitals which have so far been the monopoly of the town dwellers, should be provided to the residents of villages also, the townsmen who live in masonary houses and in an atmosphere laden with smoke, should also be brought in touch with nature by decongestion of the residential areas, and converting them into parks. The garden-city concept under which parks, open spaces, and gardens are provided in the towns, is based on this ideal. With the extension of electrification in the rural area many difficult agricultural operations, such as drawing water from wells, cutting fodder, crushing sugar cane, and rolling cotton, would be rendered easy. Apart from these, electricity will bring civilisation to the villages; the villagers will be able to make

use of their leisure time ; reading habit and knitting and sewing among women would become more common. The amenities and comforts, which electrification provides, would make life in the villages more comfortable, and ultimately the villager will be better off, for while he would be enjoying the comforts of the town he would retain nature around him. He will be living in surroundings which are free from filth, congestion, and noise, while he will be in touch with the world and civilised areas with the aid of the metalled road and the radio and the newspaper. It is by extending the amenities which modern science has provided, that the town and country would be harmonised; towns would no longer look like warts on the face of the mother earth, and villages would also no longer remain in pristine squalor.

CHAPTER 2

ORGANISATION, PROGRAMMING AND EXTENSION

When the Community Projects Scheme was launched in 1952, the administrative machinery needed for its proper implementation was created. The State Development Committee consisting of the Chief Minister and Ministers in charge of the Development Departments was constituted to lay down general principles of policy. The Development Commissioner was to act as a co-ordinating officer of the different Development Departments as Secretary of the Committee. At the district level the Deputy Commissioner was put in charge of development work, and he co-ordinates the work of the Development Departments as Chairman of the District Development and Planning Committees.

The Project Executive Officers, who belonged to the P.C.S., were also appointed as Sub-Divisional Officers to co-ordinate the work of Development Departments at tehsil level. They were assisted by Assistant Project Officers who were equivalent to Block Development Officers and were in charge of a block of 100 villages or an area with a population coverage of 66,000. In relation to the size of the country and population the staff provided for extension work under the Department of Agriculture in the pre-Community Project period was exceedingly inadequate. Two Inspectors and 4 Sub-Inspectors were required to look after the needs of a tehsil comprising 300 to 400 villages. Such meagre staff precluded individual contacts between the Extension Officers of the Department of Agriculture and villagers. Under the National Extension Service a Village Level Worker, who corresponds to the Sub-Inspector of the Agriculture, is required to look after the needs of 10 villages, and the Extension Officer (Agriculture) is equivalent to an Inspector for a group of 100 villages roughly comprising a population of 66,000. This ensured more effective and more intimate contact with the villages. In addition there were two Extension Officers, one for Animal Husbandry and another for Cooperation and Panchayats. Apart from these, two Social Education Organisers, one man and one woman, and an Overseer with health-bias were also provided. 10 Village Level

Workers, each in charge of 10 villages, were provided as field staff at the village level. The National Extension Service Development Blocks in which outstanding work is done are converted into intensive development blocks for which a sum of Rs. 10½ lakhs has been provided. The criteria for promotion into intensive Development Blocks are the extent of people's participation judged by their contribution made in cash, kind, and labour, the progress of expenditure, and the availability of properly trained personnel.

Village Development Councils

Village Development Councils have been organised with the members of the village Panchayats as nucleus for formulating development programmes for the village. The expansion of the Panchayats into Village Development Councils is a healthy step. Progressive farmers and retired officials of the beneficent departments, such as Agriculture, Health, and Cooperative, have thus became associated with development work. Such men may not have found representation on Panchayats otherwise, which are based mainly on elective principles.

Village Extension work.

The Punjabi farmer is a realist, and what he requires is not mere airy talk, but a practical knowledge of new techniques which science has discovered. In fact the villager has already had a surfeit of speeches, and he is no longer interested in mere talk. He is anxious to learn something new.

The Extension Worker should realize that an ounce of practice is worth a ton of theory. Demonstrations carried on in the fields of the cultivators are the most convincing. The use of fertilizers as well as practice of green manuring has been greatly popularised by demonstrations on the fields of the cultivators. The Village Extension Worker must be always ready to show to the villagers how to do the things which he recommends to them. He should work alongside the villagers in their fields and in their homes.

The Extension Worker, if he has to make an impression, must be a practical farmer who knows his job ; otherwise he is likely to become an object of ridicule, and in any case he will not impress the Punjabi farmer, who knows his job. The Punjabi farmer is intelligent and progressive, and he is ready to adopt an innovation provided he is convinced of its utility. Defining the meaning and

scope of extension work, Ensminger says, "Village Extension Work is both a programme and a process of "helping village people help themselves", to increase their food production and raise the general level of family and village living. Village extension work is a process in that the village worker meets with villagers individually and in groups for the purpose of getting them to think and talk about their problems, needs and aspirations. If effective, this *educational* process should stimulate individuals and groups to ask questions about their present methods of doing things, to become inquisitive to know if there are improved methods, and to press for help in getting information about these new and improved practices. It is a process of creating concern from within the village, and among the villagers, to want to push outside the boundaries of traditional experience and seek help in finding new approaches to their problems of farming and family living. This process of encouraging self-recognition of need is founded upon a basic principle of human nature ; before change and development is possible, people themselves must recognise the existence of a problem, and want to change. Basic and lasting improvement will come only from a self-created desire for improvement and not from pressure exerted from outside. It is also a process of the village worker and the villagers establishing a relationship of confidence in each other. For this process to be effective, the village worker must approach the villagers as a friend, and the villagers must accept the village worker as a friend. To gain and hold their confidence, the village worker must remain ever true to his duty of helping the villagers increase their competence by new methods so that the process of change from within can be accelerated."

An extension worker must have faith in his programme. However, it should be faith based on reason rather than on dogma. He must believe in the soundness of his programme, and unless he is himself convinced of its utility he will not be able to convince others.

After preliminary survey, the Village Extension Worker will realise the problems of the area. He must not make promises which he cannot fulfil, otherwise he will lose the confidence and trust of the villagers. One of the most important functions of the Village Extension Worker is to provide facilities for development at the door of the cultivator. If he develops a store in the village from which the villagers can get their requirements such as fertilizers, improved

implements, seeds of vegetables etc., it will greatly help in his work. If a thing is readily available, it is generally purchased and adopted even by the farmers who are lazy, and who would not take the trouble of going to a distant place.

Mr. Svinth who has been connected with extension work in India explains the meaning and scope of rural extension service as follows :

"The rural extension service as education was to act as catalytic agent between the store of knowledge and the mass of the people. This education is to lead out with people and not "pour out" on people and in order to accomplish, it is necessary to examine the total situation, enable understanding and then use a catalyst to provide avenue of reception. The Project Executive Officers are to act as catalysts which is just another name of extension worker whose characteristics are :

1. He knows (knowledge).
2. He understands (understands the problems and necessities of people).
3. He relates (uses knowledge in relation to problems and interest of people).
4. He transmits (developes line of communications which result in changing the attitudes and behaviour of the people)."

The qualities of a good leader are :—faith, integrity, enthusiasm, personality, tact, friendliness, tolerance, unselfishness, sympathy, and co-operation. A leader can achieve his objective through perseverance, courage, initiative, ability to plan, technical knowledge, power to experience, and resourcefulness.

The steps leading to proper programme building are as follows :

1. **Find the facts.** Facts are as important in building a programme as a good foundation is in the building of a house. Our foundation in programme development is "starting from where the people are". This means an understanding of all the facts—both social and economic.

2. **Recognize problems.** What do the facts reveal ? We

may recognise the problems, but do the people? Are the people interested in the problem? Do they want to do something about it?

3. **Recognize resources.** What do the facts reveal? We may say that we attempt to "help people help themselves." Is this the place to put these words into action? Too often people may look outside for help rather than recognising the resources within the situation to answer and do something about their problems.

4. **Group decision.** A decision summarises an analysis and understanding of the facts. A programme becomes a peoples' programme when they make the decisions and determine their own course of action.

5. **Set objectives.** An objective defines the decision, spells out what the group desires to accomplish. Objectives become the base for determining the plan of action.

6. **Plan of action.** A group plan will define what the jobs are, when they will be done, where, how, and by whom. Co-ordination of activities is accomplished through an effective plan of action. A plan should have flexibility.

7. **Action.** Good plans too often end as "paper plans" but this need not be. If there has been active participation by the "by whoms" in developing the plan of action, the road should be well paved for effective follow-through.

8. **Measuring results.** If we know our starting point (problems to be solved), where we are going (objective)....and how we are going to get there (plan of action), it should not be too difficult to measure progress. In short, how has the programme served to solve problems....and change the facts?

Programming

The preliminaries of programming were summarised by Mr. Loftus, in his talk given at the Project Executive Officers' Training Centre at Nilokheri as follows:

(a) To measure the existing economic situation of the area selected for the project.

(b) To determine the obstacles to development peculiar to the area.

(c) To assess the material and human resources in the area.

(d) To examine the relationship of the area to the outside world, *i.e.*, to determine what it produces and consumes, and to what extent the levels of production and consumption are depending on exports, imports, or other financial transactions with the world, outside the boundaries of the Community Project. This survey would cover the project areas' relations not only with the public authorities of the State, and with distant markets, but also with the markets in the countryside.

(e) To determine the existing patterns of utilisation of the resources of the area.

(f) To analyse the above data to determine what increase in the efficiency of utilisation of existing resources is possible.

(g) To consider such potential increase in the light of their desirability in terms of social well-being or other criteria which may matter.

(h) To determine the priority—the lines on which technical progress should be planned and the directions in which the austerity programme should proceed.

(i) To fit in such of those aims as are possible into the framework of development—financial and physical—laid down by the Community Project plans.

(j) To prepare the man power budget—enable distribution of population in different categories and methods to bring about structural shifts in occupation as envisaged in the Draft Outline.

(k) To examine possibilities for creation of avenues of employment for surplus population.

(l) To find out methods to canalise the increased purchasing power as a result of intensive extension work.

Local Planning

The first step in local planning is to make careful appraisal of the resources of the area. This is done through the detailed survey which is undertaken as soon as an area is included in the community programme. After the resources have been assessed, priorities are fixed and

proper weightage is given to the needs of the area apropos the objectives of the community scheme, the emphasis to be placed on different schemes of the programme will vary from area to area, and will have to be worked out on the basis of the results of the survey. It is here that the Project/Block Officer will have to exercise vigilance and use his intelligence and experience.

The development programme must make the maximum use of the available human and material resources in the area. There is a great deal of under-employment and un-employment in the villages, and local planning must aim at reducing these progressively through continuous development and fuller utilization of existing resources. Change in the occupational pattern of the area is also very necessary. An overwhelming proportion of the rural population subsists on agriculture. One of the major objectives of planning should be to provide alternative means of livelihood so that the present lop-sided economy is rectified, and new channels of development are opened up.

Another important principle to be kept in view is the principle of co-ordinated growth of the area. There is an inter-dependence between the various schemes of development; and unless all these schemes progress side by side there would be danger of losing the advantages which may accrue from any one of these or groups of these. For instance, if one is thinking of increasing agricultural production it is necessary that storing and marketing facilities are extended simultaneously. Again, it would be no use building up a network of roads unless production increases sufficiently to yield surpluses that are worth marketing.

Technique of Administration

The essentials for being a good administrator, may be summarised as follows:

1. Know thoroughly what your objective is, or in simple language "what is to be done and for what purpose," the objective being the attainment of a job for a particular purpose.
2. Assess your requirements and the resources at your disposal for achieving the objective by conducting the survey of requirements and resources. To put it in

other words it means "what for do I need it and what have I got ?"

3. How resources are going to be used, or what is commonly known as planning both in time as well as in space. It involves the setting up of machinery for doing a set of things in relation to each other by a set of people and allocation of duties for each one of them. It may also involve a process of breaking down the administration of the main objective into sub-objectives and then co-ordinating the activities to ensure that they function in a particular manner.

In an efficient organisation everybody concerned must know what the main objectives as well as the immediate task he has to perform and his specific responsibilities towards other members of the staff are. Responsibilities must be commensurate with authority, and lines of responsibility and authority must be clear. Personnel management involves the following steps:

1. Training the staff either in a central place or on the job.
2. Placing the staff in the right place.
3. Keeping the staff happy.
4. Maintaining discipline and morale in the staff.

The most important function of a Project Executive Officer or a Block Development Officer is that of handling men both inside the organisation and outside it. It is only by absolute sincerity and sympathy, clearness of objective and scientific approach that the Project/Block Officer can win the co-operation of the people. He must also handle his subordinate staff with sympathy and tact. It is by encouragement that the best can be taken out of a man. Where praise is due it should be given publicly and also in writing. If there is any fault in the subordinate, he should be called and quietly asked to improve. Nothing damages the personality of a man so much as belittling him in public or before his subordinates. The best way of taking co-operation from colleagues is not by bossing over them, but by working on a footing of equality. A person who makes another person feel inferior while dealing with him cannot take willing co-operation from him.

Jealousy among co-workers and subordinates should be prevented by giving equal treatment to all. Ultimately it is in activity that the success of a Community Project lies. The interest of the people must be sustained by constant activity, and those who are participating in any way in the venture of rural development work should be given all possible encouragement. Community Projects work is as much a work of the spirit as of the matter, and spirit can easily be crushed by lack of sympathy or harshness.

A very careful watch should be kept on the progress of expenditure *vis-a-vis* the amounts sanctioned scheme-wise. In fact a Project/Block Officer should review the progress of expenditure at the close of every month so that he knows where he is lagging behind. Another matter on which he should keep close watch is that of achievement of targets. Last but not least is the amount of contribution by the people in the Community Projects Scheme. It is the extent of people's participation which is reflecting by their contributions in cash, kind, and labour, that should be regarded as the barometer of progress of Community Projects work. Another matter on which careful watch should be kept is the arrangement of supplies. It should be watched whether they reach in time and in the quantity indented.

Government administration in a free and democratic country is a matter of building human relations at all levels. Where the administrator fails to build up a sound structure of such relations he fails in his work, no matter how hard working and honest he may be. There is, however, no one field through which a short cut to success may be found. The administrator has to be wise, vigilant, honest, tolerant, and resourceful, and he has to be a man of vision and faith.

CHAPTER 3

SCHEMES AND BUDGETS

Formulation of a budget is, in essence, the working out of the detailed financial implications of the working plan with reference to each scheme, its administrative organization, and necessary administrative arrangements. The budget for Development Schemes should be so framed that while it gives lines of action in a general manner and financial implications with reasonable accuracy, the individual schemes included therein should admit of flexibility and constant review from time to time. The implementation of Schemes is dependent on the people's reaction, and the financial implications of the schemes should, therefore, be worked out taking this factor into consideration. Because of this limitation, it is clear that it would not be possible to work out financial implications of a scheme in minutest details but at the same time it should be possible to indicate broadly the nature and use of various schemes that would be worked and the broad financial outlay involved therein, which would be useful for practical purposes.

Preparation of Schematic Budgets and Programmes

After the Project/Block area is known and a Project Block Officer is appointed he should conduct a detailed survey of the entire area to formulate a fairly clear programme for raising the level of rural life in that area. The pattern of a programme and the order of priorities in planning will depend upon the needs and resources of the area. The various aspects of rural life are inter-related and one or a few of them cannot be pushed up while others remain behind and untouched. The method should, therefore, be a coordinated approach to rural life *as a whole* bearing in mind that the Government Administration is there to assist the people to improve their condition by their own efforts. The multipurpose character and the initiative and active participation of the people in the selection and execution of the schemes of development, should be considered as two vitally important features of a complete programme. Financial allocations under each item of the proposed programme should be estimated, and a consolidated statement prepared.

Thereafter, the programme and budget estimates would be discussed in the Project/Block Advisory Committees. The consolidated budget and programme in respect of the Community Projects and Development Blocks allotted during 1952-53 require the final approval of the Community Projects Administration and the programme and budget estimates pertaining to the Community Development Blocks allotted during 1953-54 and National Extension Service blocks are sanctioned by the State Government. The mere approval of the consolidated budget estimates of a Block/Project does not authorise the Block/Project Officer to draw money for the execution of the Schemes unless separate provision exists in the Yearly State budget, and regular allotment of funds is placed at the disposal of Drawing and Disbursing Officer for expenditure. For this purpose Block/Project Officers are required to submit detailed Memorandum as to the mechanism of a Scheme along with Schedule of New Expenditure each year by the 15th August for the Budget relating to the year following. Thus according to the provision in the consolidated budget each year detailed schemes have to be prepared well in advance. In fact the consolidated budget should be supported by detailed schemes for three years and after it is once approved, only relevant extracts are to be forwarded as Explanatory Memorandum to Schedule of New Expenditure. After the necessary survey through Village Level Workers and independent assessment of general needs by the District Development Officer, the Project/Block Development Officer should determine what schemes cannot be undertaken or initiated by the Village people through agencies like Panchayats, Co-operatives and other associations entirely on their own, but with the assistance and initiative of the Project staff and executive officer. A separate list of such schemes should be drawn up and forwarded along with the consolidated budget and the Schemes which are subsequently initiated by the Village Level Workers and Executive Officers should also be sent from time to time.

Project Officer should, on the basis of priorities fixed by him draw up the Schemes in which the works are to be taken by the Panchayat or other local bodies but grant-in-aid is to be given out of the Project funds. The limits of public contribution for various types of works has been laid down separately. Project Executive

Officers should make themselves conversant with those conditions of grants-in-aid.

The schemes which are actually to be financed out of Project funds should then be worked out, taking into consideration the demands of various departments and the desirability of maintaining the multipurpose character of the programme.

It is absolutely necessary that in the programme budget (also called consolidated budget estimates) provisions are not made at random. In support of these provisions there should be details clearly indicating the expenditure on staff, equipment and the mode of implementation of the Scheme. While forwarding the consolidated budget estimates, these schemes, in support of budget provisions intended to be made for each year of the three-year programme, should also be supplied.

There is a tendency on the part of local officers to draw up the schemes themselves. The schemes should be in the first instance drawn up by the Extension Officers attached to the Block or other officers representing the District Development Officers of the Block areas. If no such officer is available the Schemes should be drawn up by the District Development Officer concerned. He should be approached for this work through Deputy Commissioners. Once the Schemes have been drawn up by the Extension Officer they should be forwarded to Deputy Commissioner who may be requested to pass them on to District Development Officers for scrutiny and approval. After reasonable time is afforded to District Development Officer for comments the matter should be considered in a meeting presided over by the Deputy Commissioner.

An ideal development programme should envisage the fulfilment of the following objectives:

(a) The extermination of poverty which is the greatest evil in rural life and is mainly due to under-production, unemployment or under-employment. The increased production will need (1) reclamation of waste and virgin land (2) provision of irrigation facilities (3) adoption of scientific methods of agriculture, animal husbandry and fisheries (4) organisation of credit facilities for agriculturists, and (5) improvement of means of

communication and marketing facilities. The encouragement of cottage industries and improvement in the skill of the existing artisans will help to alleviate unemployment.

(b) Extermination of disease and ignorance by providing health, education and other social welfare services.

While working out the detailed financial implications of the schemes, the following expenditure limits should be regarded as ceilings for each type of Project/Block for three years which should not be exceeded unless the State Government undertakes to bear the entire excess expenditure by themselves:

Projects/Blocks	Total Allocation (Rs. in lakhs)		Remarks	
(a) Community Project (Basic (type of 1952-53 series).	65			
	Grant :	35.09	Rupee expr.	58.47
	Loan :	29.91	Dollar expr.	6.53
(b) Community Development Block (Basic Type).	15			
	(*i*) Grant :			
	Recurring	4.23	Rupee Expr.	13.60
	Non-recurring	3.28	Dollar expr.	1.40
	Total	7.51		
	(*ii*) Loan :	7.49		
(c) National Extension Service Development Block.	7.50			
	(*i*) Grant : Recurring	1.50	Rupee Expr.	7.50
	Non-recurring	2.00	Dollar Expr.	nil
	Total	3.50		
	(*ii*) Loan :	4.00		

A National Extension Service Block which will be converted into a Community Block and has completed the allotted span of three years will get the following additional amounts for development

expenditure :

	Total allotment for National Extension Service Block Rs. in lakhs	Additional allotment for converting into Community Block Rs. in lakhs	Total allotment Rs. in lakhs
Grant ..	3.50	4.01	7.51
Loan .. (Excluding short-term credit of Rs. 3 lakhs provided by the Reserve Bank, etc.)	1.00	6.49	7.49
Total ..	4.50	10.50	15.00

It needs to be emphasised that the programme as drawn up in the consolidated budget is not invariably to be drawn up according to the model schematic budget prescribed. The programme can be varied according to the local conditions and needs, subject to the following conditions :

1. The prescribed limits in respect of total expenditure, rupee expenditure, and other than loan expenditure, in the schematic budget are not exceeded.
2. Total recurring and non-recurring expenditure as laid in the schematic budget is not exceeded.
3. Dollar provisions and rupee provisions are strictly followed as it is not possible to convert rupees into dollars and vice versa.
4. Expenditure on staff is within the ceiling prescribed.
5. Money provided as loan cannot be converted into grant-in-aid and the ceiling on these cannot be departed from.

Preparation and Sanction of Schemes (other than works)

For the preparation of a scheme the following basic principles should be observed :

1. Each Scheme should have some objective or target to achieve within the scheduled period.
2. Necessary provision of funds should exist in the State budget.

3. The assistance and co-operation of the people, affected where necessary, should be forthcoming.
4. The details should be prepared by some responsible official of the technical department concerned.
5. There should be sufficient grounds to justify the anticipated benefits that the scheme will procure for rural people.
6. Necessary equipment and material should be available for the execution of the scheme.
7. The self-financing schemes should be financed by loan money only.

Targets

In the consideration of any programme the minimum facilities intended to be provided by a Community Project should be borne in mind. These should approximate the minimum aid by the Community Projects Administration. As the conditions of the Punjab warrant higher level of development, the targets have been separately reviewed and fixed for each Project Block. The minimum targets are :

Community Projects

1. *Agriculture and Animal Husbandry :*

(*i*) One seed multiplication farm (for seeds of the strains found suitable by State Agriculture Department) for a group of about 100 villages (along with suitable arrangements for the multiplication, storage and distribution of such seeds).

(*ii*) A systematic arrangement for the development of the local manurial resources for every village.

(*iii*) A permanent arrangement for dealing with plant diseases for every village.

(*iv*) One multipurpose co-operative society for every village or a small group of villages, on which every agriculturist family should be represented. It is desirable that in addition to other items, the multipurpose cooperative society should take up the programme of 'agricultural supplies' schemes like distribution of seeds, fertilizers, improved implements, work animals etc.

(v) One small model farm for about 5 villages, located in the field of some agriculturists in the area, for the demonstration and introduction of improved agricultural practices.

(vi) One unit of key village scheme and artificial insemination centre, for about 100 villages.

(vii) Development of fisheries in the village tanks, wherever this is possible; and encouragement of poultry-keeping in every household.

2. *Irrigation:*

Irrigation facilities for about 30 to 40 per cent of the total cultivated area.

3. *Reclamation:*

Reclamation of about 10% of the cultivated area.

4. *Drinking water supply:*

One rural six-bedded dispensary with arrangement for mobile van.

5. *Health:*

Health service for about 100 villages.
2 Wells or equivalent facility, per village.

6. *Education:*

Adequate provision for about 45% to 60% of the population of the age group 6-11 at the end of three years. Introduction of basic system of education in as many primary schools as possible, and in a few middle and high schools, where they exist.

7. *Social Education:*

One Community Recreation Centre and one Adult Literacy Centre, for about 5 villages.

8. *Communications:*

One culvert and 2 miles katcha road per village.

9. *General:*

A Panchayat and/or *ad hoc* village body, for every village or a group of small villages.

National Extension Service Blocks

In the fields of Agriculture and Animal Husbandry the aim should be to achieve the targets set up for Community Projects. A small beginning should be made in all other fields.

As already observed, the Schematic Budget is only intended to be a guide rather than a rigid pattern to be followed. Except for the financial limitation already mentioned, the programme is absolutely flexible and can be even drastically changed to suit particular conditions of an area. The following principles, however, should be kept in view at the time of formulation of the programme.

Irrigation

The allotment made for irrigation schemes is intended to be utilised normally for new works. While preparing the schemes care is taken to ensure that permanent arrangements would be left behind for the proper maintenance of the works created under the programme. The entire provision is made under "loan" head. If any subsidy is proposed to be paid for exploratory or protective works, the entire expenditure on that account is borne by the State Government. The allotment made is not to be utilised for the repair and maintenance of existing irrigation works which are the direct responsibility of the State Government. However, in case of irrigation works, which, according to customary practice, are to be maintained by the cultivators, money can be advanced out of the budget funds after ensuring that the works would be properly maintained by the villagers.

Reclamation

Reclamation of virgin land is to be undertaken only after first making adequate arrangements for the intensive cultivation of the cultivated area.

Health

Emphasis is laid on the preventive rather than the curative aspect of medical and health activities. A limited number of first-aid kits required for Village Level Workers are supplied by the Red Cross Society free of cost.

Rural Housing

The allotment under this head is meant for constructing modest but sanitary dwellings for agricultural workers and other landless labourers who are poorly housed.

Education

The programme lays emphasis on primary education, especially of the basic type.

Social Education

Community recreation centre, adult literacy centres, and miscellaneous recreational and cultural centres like clubs are opened in each Village Level Workers' unit of villages at a modest cost, and the services of school teachers and other village functionaries are utilised for these as far as possible.

Communications

Plans are drawn with a view to connecting every village with a fair-weather road. The entire earthwork is done by the villagers, government aid being limited to providing skilled labour and materials required for the construction of culverts, bridges etc.

Rural Arts, Crafts and Cottage Industries

The allotments for these are normally to be utilised for improving the existing talent. The provision required for schemes of training is included in "other than loan" head, whereas that required for setting up production centres is included in the "loan" head of expenditure.

Purchase of Equipment

Necessary dollar provision is made for various items of equipment proposed to be purchased from the dollar funds while preparing the budget estimates.

Purchase of imported equipment has to be made through the Community Project Administration. Purchase of stores, machinery and equipment manufactured in India is made directly by the State Government under the normal State Purchase procedure although this has been somewhat relaxed to cope with development work. Loans can also be advanced to farmers and cooperative societies for the purchase of necessary equipment direct provided it is of Indian manufacture.

It is intended that the Grow More Food expenditure as well as expenditure in regard to other items of centrally assisted development schemes, *e.g.*, health, education, communications, irrigation etc. will to the extent possible, be concentrated in the areas selected for Community Development, and the schemes under the Community Development Programme will be in addition to these items.

Amount Sanctioned

The following table gives broad break-up of the amount sanctioned for the present for each Community Development Area :

Project	Total amount Rs. in lakhs	Loans Rs. in lakhs		Grants Rs. in lakhs	
		Centre's share	State's share	Centre's share	State's share
1. Batala	58·79	27·89	—	19·99	10·91
2. Jagadhri	58·39	24·00	—	22·25	12·14
3. Nawanshahr	62·76	30·35	—	20·97	11·44
4. Sonepat	57·13	23·92	—	21·49	11·72
5. Nilokheri	22·63	7·78	—	12·28	2·57
6. Faridabad	42·53	19·93	—	18·61	3·99
7. Thanesar	14·18	6·84	—	4·47	2·87
8. Kulu	14·79	8·05	—	4·11	2·63
9. Naraingarh	14·88	7·39	—	4·57	2·92
10. Tarn Taran	14·95	7·49	—	4·55	2·91

The amount provided for each NES Block is Rs. 7·5 lakhs out of which Rs. 4 lakhs would be advanced as loans and Rs. 3·5 lakhs disbursed in the form of grants. The Centre's share would be Rs. 1 lakh on the loans side, and Rs. 2·25 lakhs on the grants side.

The expenditure is shared between the Centre and the State as below:

	Centre	State	Remarks
Recurring	50 %	50 %	*Subject to a ceiling of Rs. 6·15 lakhs for a Community Project of the 1952-53 series.
Non-recurring	75 %	25 %	

The programme and budgetary provision of the Projects and Blocks normally extend over a period of three years. In case of the Community Projects/Blocks of 1952-53 the period of operation has been extended by one year.

* In case of Nilokheri and Faridabad Blocks the Centre has assumed additional liability of 50 % of the State's share of expenditure calculated on the above basis.

CHAPTER 4

CAMPAIGNS, DRIVES, INCENTIVES AND AWARDS

Development work will receive considerable impetus if it is carried out in the form of campaigns and drives. A definite period should be set for each campaign and date-lines fixed. The campaign should be given a spectacular start, and all media of publicity, such as press conferences, posters, poster charts, radio broadcasts, films, and work-songs, should be utilised to prepare the people for the task. By organising competitions between villages, blocks, tehsils, and districts competitive instinct can be exploited for stimulating development work. The following Campaigns and Drives are suggested:

Pohli Eradication Campaign

Pohli is an obnoxious weed which causes considerable loss of foodgrains. Unless steps are taken on a State-wide basis, it cannot be eradicated. Besides, Pohli should be eradicated before its seed matures. In this work there is need of participation of everyone. School and college boys can play an effective role, and the entire staff of Revenue, Development, and Education Departments, too, should be mobilised. The Project Executive Officers should prepare a plan of work well in advance, and a reasonable number of villages should be assigned to each officer to ensure proper supervision. The best time for the campaign is from the middle of April to the first week of May.

Campaign for distribution of Fertilizers

Ammonium Sulphate and Super-Phosphate can be distributed for Kharif crops in the months of May and June, and for Rabi Crops in September and October. This work should be done in the form of a drive, and the results assessed in the first week of July, and in the first week of November.

Tree Planting Campaign

This work can only be started in the rainy months of July, August, and September. Results should be assessed in the month of October. Trees are usually planted and no attention is paid to their irrigation and protection. This deserves to be discouraged, and only genuine work should be taken into consideration while assessing the results.

Campaign for Road Making and Digging of Drains

This type of work can only be undertaken when the farmers are free from their normal work. As such, it can be effectively carried out in the winter months from December to February, and in summer in May and June.

Incentives and Awards

Rural development work is of a difficult nature, and the workers, whether officials or non-officials, have to overcome many hurdles. A person puts in exceptional effort if he is suitably encouraged and his spirit is roused. To keep up the tempo of work it is very essential that good workers should be given suitable awards. This is particularly necessary at the close of campaigns and drives. In the case of officials special entries in their character rolls and letters of commendation issued by the Government provide incentive to good work. Non-officials who put in work of an outstanding nature may be honoured by award of certificates of merit. The Third Development Commissioners' Conference recommended that the following incentives and awards may be offered:

(1) *Security of Service:* It is essential for the success of the scheme that the staff employed in National Extension Service and Community Project areas be recruited on a permanent basis.

(2) *Selection Grades:* Selection Grades should be instituted for Village Level Workers and others. It will serve as a powerful incentive to good work.

(3) *Promotion to higher posts:* At least 25% of the higher posts should be reserved for Village Level Workers.

(4) *Free Travel Facilities:* State should give facilities to outstanding workers from the Project Executive Officers downwards so that they can acquaint themselves with work in which they are interested in other parts of India.

(5) *Awards for non-officials:*

(a) *For individuals:* Commendation certificates should be given by Government to persons who do outstanding development work on the recommendations of the Project Executive Officers made through Deputy Commissioners and the Development Commissioners.

(b) *Commendation tablets for groups:* Villages in which outstanding development work is done should be awarded commendation tablets on which the outstanding items of work should be detailed. Such tablets should be fixed in a prominent place in the village.

(c) *Community prizes:* Villages which give the most outstanding performance in a Block or Project should be given collective cash prizes, which may range from Rs. 2,000 to Rs. 5,000. The criterion of judging outstanding work should be the extent of people's participation. Such prizes should be given yearly. The prize money should be used for development work in the villages.

(d) *Prizes in kind:* For agricultural work awards should be given in the shape of improved implements and utility articles.

The prizes for good work should be awarded at melas and fairs and functions specially arranged for the purpose.

CHAPTER 5

COMMUNITY DEVELOPMENT AREAS

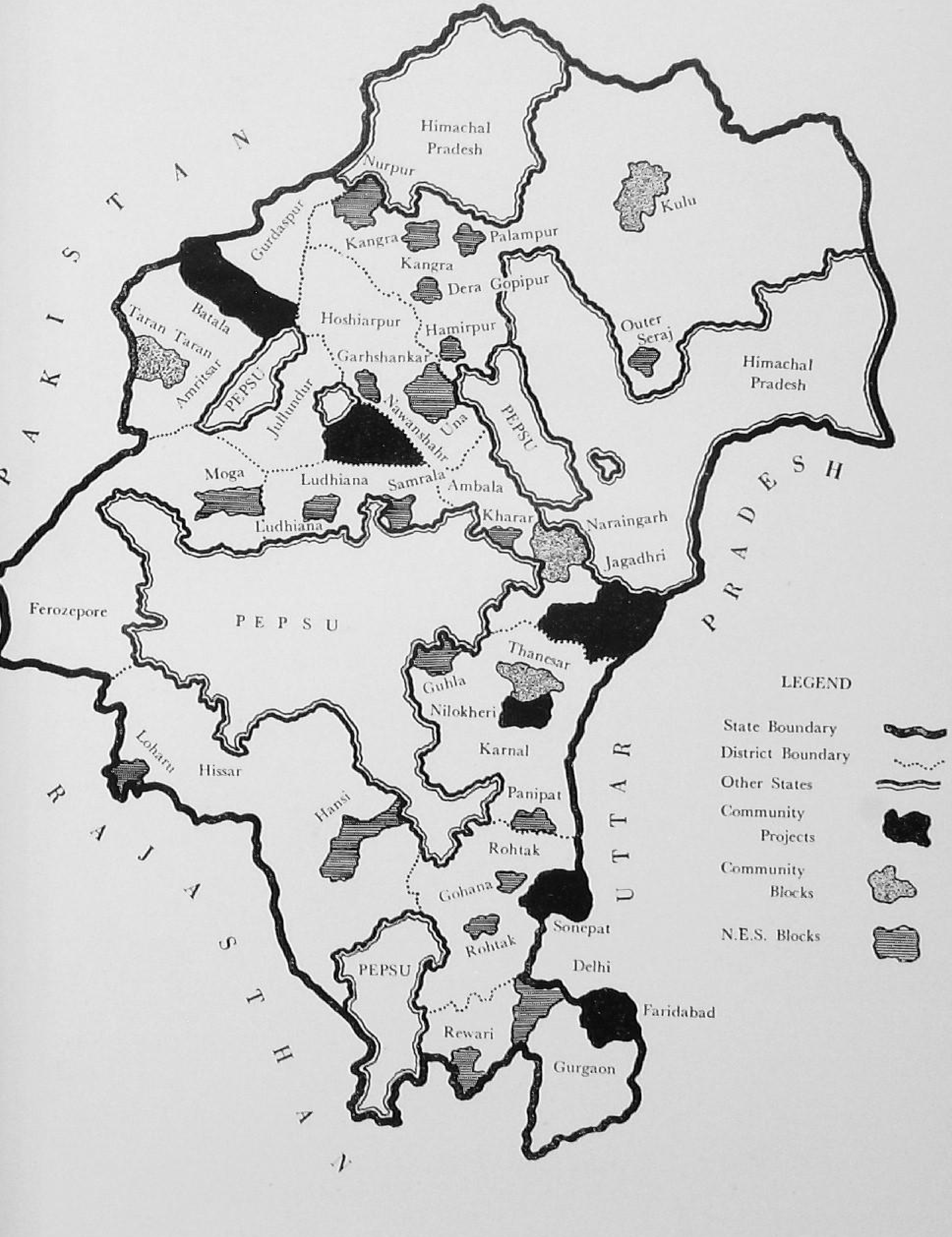
The areas in which the Community Project Scheme is in operation are: Kulu, Batala, Nawanshahr, Jagadhri, Sonepat, Faridabad, Nilokheri, Thanesar, Naraingarh, and Tarn Taran. In addition, there are 18 blocks in which work has started under the National Extension Service Programme. These between themselves cover 4,500 villages with a population of 29 lakhs. The Community Development Schemes thus affect more than 23% of the total population. The coverage would increase progressively as more blocks of villages are included in the Programme year after year.

It would be useful here to review the economic conditions of the Community Project Areas on the eve of the inauguration of the Scheme. This would provide the bench-mark for gauging the progress of work.

Batala Project

The Project covers 487 villages in the sub-montane region of Gurdaspur district, and embraces a population of 3.39 lakhs spread over 3,01,911 acres. Batala Tehsil is a thickly populated area, with a density of 718 persons to the mile. The villages are over-crowded, and men and cattle often share the same mud tenements. The people are mostly Sikh Jats, very energetic and pushing, but torn by internecine jealousies and enmities. They are excellent farmers with love of agriculture in their blood. On account of heavy pressure of population, their holdings are very small; and even grazing ground for cattle does not exist in 95% of the villages. There are few village industries; and craftsmen have been migrating to towns, particularly to Batala, where the growing factories and trade offer good employment. The rich alluvial soil, good rainfall, canals, and favourable climate, combine to enable the rural people to eke out a mere living. Consolidation of holdings work, which has been almost completed, has stemmed growing poverty; but the living standards must continue to be low until the entire rural economy is re-orientated.

Community Development Areas in Punjab.



Other important information is given below:

Population (1951 Census):

Urban	76,273
Rural	2,62,569
Displaced settlers	1,16,860

Land Utilisation and Irrigation

Sown area	2,09,088 acres
Current fallows	35,133 acres
Culturable waste	20,814 acres
Unculturable land	36,876 acres
Forests	Nil
Level of water table	12 to 14 feet
Irrigated Area	1,92,900 acres
(*i*) Canal irrigated	76,145 acres
(*a*) Perennial	7,304 acres
(*b*) Non-perennial	68,841 acres
(*ii*) Well irrigated	1,14,188 acres
(*iii*) Irrigated from other sources	2,567 acres
Rainfall.	33.08 inches

Crops grown

Rice	14,000 acres
Maize	14,000 acres
Sugarcane	15,000 acres
Cotton	4,500 acres
Wheat	90,000 acres
Gram	24,500 acres

Communications

Roads:

(*a*) Metalled	54 miles
(*b*) Unmetalled	115 miles

Principal Towns, Industrial Centres, and Markets

(*i*) Batala — It has a population of 50,513 persons and is an important industrial and marketing centre.

(*ii*) Fatehgarh Churian	Its population is 6209. It is a centre of cotton spinning and weaving.
(*iii*) Qadian	Population is 11,585.
(*iv*) Sri Hargobindpur	Population is 2801.
(*v*) Dera Baba Nanak	Population is 5165; touches the Indo-Pakistan boundary; is a wool spinning and weaving centre and has other industries too; the climate is ideal for mulberry plantations.

Medical Services One hospital; seven dispensaries, and two maternity and child welfare centres.

Education Two colleges; twelve High Schools for boys; five Middle Schools for boys and three for girls; twenty-four Middle Schools for boys; fifty-one Primary Schools for boys; and twenty-one Primary Schools for girls.

Animal Husbandry Six Veterinary Hospitals and permanent outlying dispensaries; one horse and donkey stallion; a fisheries research station; eighty two approved stud bulls; twenty-nine approved stud buffaloes; and fourteen cattle breeding societies.

Nawanshahr Project

Three lakh persons living in 382 villages of Nawanshahr Tehsil and a part of the contiguous Tehsil of Phillaur come within the scope of the Project. This area is the easternmost part of the Jullundur district, and at one point almost touches the Shiwalik hills. The land is plain with no undulations. There are four assessment circles, representing the main soil types: Dhak circle contains the best soil; Retli circle has pronounced percentage of sand; and Dhaya Bet, and Bet circles encompass the riverain area.

Originally only the Nawanshahr Tehsil was covered by the Project. However, 92 villages of the Phillaur Tehsil were also incorporated in it later. No detailed survey of these new villages has been conducted, and hence the statistical and other data available relate only to the Nawanshahr Tehsil. A summary of this information is given below:

Population (1951 Census)

Urban	27,451
Rural	1,94,877
Displaced settlers	35,318

Land Utilisation and Irrigation

Sown area	1,30,059 acres
Current fallows	12,831 acres
Culturable waste	21,932 acres
Unculturable land	26,609 acres
Forests	Nil
Level of water table	10 to 12 feet in the Bet, and 20 to 30 feet elsewhere
Irrigated Area:	
(*i*) Canal irrigated	Nil
(*a*) Perennial	Nil
(*b*) Non-perennial	Nil
(*ii*) Well Irrigated	99,835 acres
Rainfall	33.8 inches

Crops grown (area)

Rice	1,400 acres
Wheat	54,000 acres
Gram	18,700 acres
Maize	21,000 acres
Sugarcane	13,700 acres
Cotton	2,400 acres

Communications

Roads	
(*a*) Metalled	24 miles
(*b*) Unmetalled	110 miles

Principal Towns, Industrial Centres, and Markets

(*i*) Nawanshahr	Population: 10,997; is a flourishing Mandi.
(*ii*) Banga	Population 9,873; has a Mandi.
(*iii*) Rahon	Population 6,581.
Medical Services	Two Civil dispensaries and two rural dispensaries, with 154 and 11 beds respectively.
Education	Twelve High Schools for boys; 61 Primary Schools for boys; and 19 for girls.
Animal Husbandry	Three verterinary hospitals with 10 temporary outlying dispensaries; one horse and donkey stallion centre; 42 cow-bulls and 50 buffalo bulls; 29 Breeding Societies.
Small-scale and Cottage Industries	Industrial activity is confined mostly to Nawanshahr and Banga, and their suburbs; cotton and art-silk weaving on hand-looms, tanning and small-scale engineering industries are localised there.

The Project covers 549 villages with a population of 2,94,000, and area of 4,15,000 acres. Originally, only 407 villages had been included in the Project. However, 187 villages of the adjoining Ambala Tehsil were added to the area, later. This block of new villages contains a number of evacuee villages which have been allotted to displaced persons from Gujerat who are good cultivators. By the inclusion of this area it would be possible to link Jagadhri with Ambala Cantt.

Jagadhri Project

The Jagadhri Tehsil from which the Project derives its name is separated in the east from the Saharanpur district of Uttar Pradesh by the River Jamuna. In the south it adjoins the Thanesar Tehsil of Karnal. It is a sub-montane area touching the offshoots of the Shiwalik range. The soil is generally good alluvial loam, similar in

character to the soil in the sub-montane tehsils of Hoshiarpur District. The hilly tracts are generally without vegetation. The craggy hills are used only as grazing ground. The Kalesar Area of 19 sq. miles in the eastern corner of the tehsil is separately demarcated as Government land under the Forest Department. Sal trees grow there. The head-works of the Western Jamuna canal are situated at Tajewalla where a very strong masonry dam has been built across the Jamuna. Between Tajewalla and Dadupur the canal follows for the most part the course of an old river bed. Some other information about the Project area is given below:

Population (1951 Census)

Urban	47,966
Rural	1,60,715
Displaced settlers	42,212

Land Utilisation and Irrigation

Sown area	1,86,539 acres
Current fallows	14,868 acres
Culturable waste	34,941 acres
Unculturable land	64,290 acres
Forests	11,906 acres
Level of water table	12 to 35 feet
Irrigated area:	
(*i*) Canal irrigated	8,255 acres
(a) Perennial	8,255 acres
(b) Non-perennial	Nil.
(*ii*) Well irrigated	2,725 acres
(*iii*) Irrigated from other sources	724 acres
Rainfall	36·04 inches

Crops grown (Area)

Rice	26,150 acres
Wheat	38,700 acres
Gram	30,080 acres
Maize	6,800 acres
Bajra	6,850 acres
Barley	2,250 acres
Sugarcane	13,400 acres
Cotton	1,450 acres

Communications

Roads :

(a) Metalled	36½ miles
(b) Unmetalled	68 miles

Principal Towns, Industrial Centres and Markets

(1) Jagadhri	Population is 24,064.
(2) Jamna Nagar	Population is 15,810 ; 4 big mills are located here—Sugar, Paper, Chemicals and Vegetable Products factories. It is a big timber market.
(3) Buria	Population is 3,642.
(4) Chhachhrauli	Population is 4,450.

Medical Services	One civil hospital ; three civil dispensaries, and 3 rural dispensaries and one maternity and child welfare centre.
Education	6 high schools for boys ; 8 middle schools ; 63 primary schools for boys ; and 10 primary schools for girls.
Animal Husbandry	Two veterinary hospitals and 8 temporary outlying dispensaries attached to them ; one donkey stallion ; 116 stud cow-bulls and 122 buffalo-bulls ; 40 Breeding Societies.
Small-Scale and Cottage Industries	It is a premier brass utensils manufacturing centre in the Punjab. Other industries in the tehsil are : (1) Gur & shakkar making. (2) Saw milling. (3) Manufacture of tea chests. There are also a Vocational Training Centre, an Engineering Works Centre, and Wood Working Work Centre.

Faridabad Project

The project covers the whole of Ballabgarh Tehsil. Two hundred and six villages with an area of 1,84,037 acres, and population of 1,30,500 fall within it. The Ballabgarh tehsil occupies the north-eastern corner of Gurgaon district which is the southern-most of the 13 districts of the Punjab. It is bounded on the north-west by the Delhi district; on the east by the Jamuna river which separates it from the district of Bulandshahr in Uttar Pradesh; on the south by Palwal tehsil; and on the west by Gurgaon tehsil. The soil is generally sandy, and particularly near the hills it is of very inferior quality. Some parts present a desolate appearance with mounds of sand. The banks of the Jamuna are generally high, but there is a small track between the main and the small channel of the river which is low-lying and fertile, though liable to inundation. Adjoining this tract there is a stretch of good land with rich soil. The average density of population is about 450 persons to a mile. The population consists mostly of Hindu Jats, who are strong and hard-working. The township of Faridabad, which is developing into a good industrial town, is situated in the area. Being near Delhi this block enjoys situational advantage. The water table is fairly high; and the installation of tube-wells and pumping sets can improve the water supply. Other necessary information is given below:

Population (1951 Census)

Urban	37,497
Rural	91,357
Displaced settlers	27,453

Land Utilisation and Irrigation

Sown area	1,17,214 acres
Current fallows	6,745 acres
Culturable waste	21,543 acres
Unculturable land	37,231 acres
Forests	1,304 acres
Level of water table	25 to 35 ft.
Irrigated area:	
(*i*) Canal irrigated	100 acres
(*a*) Perennial	100 acres
(*b*) non-perennial	Nil

(*ii*) Well irrigated	16,195 acres
(*iii*) From other sources	907 acres
Rainfall	17.84 inches

Crops grown (Area)

Rice	5 acres
Wheat	15,746 acres
Gram	11,445 acres
Maize	370 acres
Jowar	12,894 acres
Bajra	23,000 acres
Barley	28,173 acres
Sugarcane	668 acres
Cotton	12,894 acres

Communications

Roads:

(*a*) Metalled	15 miles
(*b*) Unmetalled	84 miles

Principal Towns and Industrial Centres

1. Ballabgarh	Population is 588.
2. Fatehpur Biloch	Population is 2,366.
3. Tigaon	Population is 4,784.
4. Faridabad	Population is 4,784.
5. New Township Faridabad	Population is 23,254. Developing industrial town.

Medical Services

There are Municipal & District Board dispensaries at Ballabgarh, Faridabad, Mohna, Tigaon, Pali and Dhawja.

Education

5 high schools; 8 middle schools; 38 primary schools; and 6 basic training schools.

Animal Husbandry

Veterinary Hospitals are located at Ballabgarh, Faridabad, and Chhainsa.

Small-scale and Cottage Industries

Power looms for textiles, and a salt refinery are located in the new township.

Sonepat Project

Thr Project covers the whole of Sonepat Tehsil and 22 villages of the adjoining Rohtak Tehsil. It embraces 263 villages with an area of 3,09,125 acres and population of 2,90,999. The land has the general aspect of a level alluvial plain without any hills or eminences of magnitude. The general direction of the drainage is from north to south, the slope being very gradual throughout. The soil is generally good, which when properly irrigated yields splendid crops in return for little labour. Jats, Brahmins, and Harijans are the predominant tribes. The Jats are a straightforward people, very industrious, and good cultivators. In appearance the people are distinctly Hindustanis, their faces reflecting, as Mr. Fanshawe noted, "The warm colour of the soil they till". They have generally fine physique. With regard to the size of villages, Rohtak district is exceptional, the average population of each being about 2,000—a figure which is not approached anywhere else in the Punjab. Another notable feature in the villages is the presence of a large number of pacca houses. Before 1914 the houses of the farmers were usually Kacha. However, with the extension of irrigation from the Western Jamuna Canal prosperity came to the area. Other information of note is given below:

Population (1951 Census)

Urban	33,195
Rural	2,20,699
Displaced settlers	32,392

Land Utilization and Irrigation

Sown area	27,500 acres
Current fallows	Nil
Culturable waste	3,503
Unculturable land	6,623 acres
Forests	Nil
Level of water table	17 to 20 ft
Irrigated area :	
(*i*) Canal irrigated	1,03,119 acres
(*a*) Perennial	1,03,119 acres
(*b*) Non-perennial	Nil.
(*ii*) Well irrigated	66,964 acres
(*iii*) From other sources	81 acres
Rainfall	19.4 inches

Crops grown (Area)

Wheat	50,798 acres
Gram	66,183 acres
Maize	3,472 acres
Jowar	33,001 acres
Bajra	22,901 acres
Barley	14,801 acres
Sugarcane	13,862 acres

Communications

Roads:

(*a*) Metalled	50¼ miles
(*b*) Unmetalled	47½ miles

Principal Towns, Industrial Centres, and Markets

1. Sonepat — Population is 33,195; is being developed as an industrial centre.
2. Ganaur — Population is 5,498.
3. Murthal — Population is 5,519; is a marketing centre for chillies.

Medical Services

A civil hospital at Sonepat; a civil dispensary at Jaun; two rural dispensaries and one maternity and child welfare centre at Sonepat.

Education

One college; 8 high schools for boys; one A.V. middle school for boys and one for girls; 4 vernacular middle schools for boys; 22 lower middle schools for boys; 66 primary schools for boys, and 21 for girls; and 2 co-educational schools.

Animal Husbandry

Five veterinary hospitals with 20 temporary outlying dispensaries attached to them; one donkey and one horse stallion; and 240 approved cow-bulls and 124 buffalo-bulls.

Small-scale and Cottage Industries — Hand loom weaving; tanning; basket making; niwar and tape making; dairying; gur and shakkar making and manufacture of steel. There is a Vocational Training Centre also. A big industrial area has also been planned.

Nilokheri Block

This Development Block consists of 135 villages with an area of 1,57,872 acres and population of 75,000. Nilokheri has become renowned for the experiment in co-operative working and living. The Development Block is situated in the north-west corner of Karnal district. It is a low-lying area. The population consists mostly of Jats, Rors, and Gujars. The life of an average villager is monotonous and full of toil. He is however, marvellously patient and wears a contented look. His wants are few and easily satisfied. The people are very superstitious and observant of all sorts of omens. Every clan is exogamous—while every man must marry into his own tribe, no man can marry into his own clan. The Jats are pre-eminently the agricultural caste of the tract, and are first-rate cultivators. The Gujars are a notorious thieving tribe. The Rors are almost as good cultivators as the Jats, and are much more peaceful and less grasping in their habits than they are. Other information of interest is given below:

Population (1951 Census)

Urban	13,117
Rural	61,987

Land Utilisation and Irrigation

Sown area	74,510 acres
Current fallows	1,436 acres
Culturable waste	1,905 acres
Unculturable land	66,993
Forests	13,028
Level of water table	21 to 25 ft.
Irrigated area :	35,767 acres
(*i*) Canal irrigated	16,636 acres
(*a*) Perennial } (*b*) Non-perennial }	16,636 acres

(*ii*) Well irrigated	18,639 acres
(*iii*) From other sources	492 acres
Rainfall	27.02 inches

Crops grown (Area)

Rice	16,396 acres
Wheat	17,238 acres
Gram	8,352 acres
Maize	6,858 acres
Bajra	2,325 acres
Sugarcane	190 acres
Cotton	135 acres

Communications

Roads:

(*a*) Metalled	15¼ miles
(*b*) Unmetalled	22 miles

Principal Towns, Industrial Centres, and Markets

1. Nilokheri	Population is 7,023
2. Taraori	Population is 6,094

Medical Services — One civil hospital at Nilokheri; one civil dispensary at Taraori; and two Ayurvedic dispensaries at Kirmich and Bhadson.

Education — One high school at Nilokheri.

Animal Husbandry — One veterinary hospital at Nilokheri.

Small-scale and Cottage Industries — Two training centres for weaving and carpet making; one training-cum-production centre for weaving for women.

Naraingarh Block

One hundred and sixty three villages of Naraingarh Tehsil of Ambala District have been taken up under the Community Project Programme. The Block has a population of 66,800, and an area of 1,75,314 acres. The chief communities inhabiting the villages are Gujars, Sainis, Rajputs and Harijans. The Harijans are mostly landless agricultural

labourers. The people are backward and conservative. The village population is divided into two distinct groups: the peasantry and the Harijans. Each community keeps to itself. The nature of soil varies from place to place. The average soil is, however, good though in 25% of the villages, where the upper layers have been washed off, it is of very poor quality. Soil erosion is a big problem in such villages. Choes, Streams and Nadis passing through these villages drain away the soil. Levelling, Watbandi and afforestation are very necessary. About 55,000 acres of land are under the forests of Morni Hills, which constitute almost one third of the area. The Block is not connected with any Railway Line. Some other information of note is given below:

Population (1951 Census)

Urban	13,117
Rural	61,987
Displaced settlers	4,113

Land Utilisation and Irrigation

Sown area	80,655 acres
Current fallows	9,378 acres
Culturable waste	11,274 acres
Unculturable land	19,083 acres
Forests	2,863 (excluding approximately 52,060 acres of Morni Hills)
Level of water table	20—50 ft.
Irrigated area:	
(*i*) Canal irrigated	Nil
(*a*) Perennial	Nil
(*b*) Non-perennial	Nil
(*ii*) Well irrigated	299 acres
(*iii*) Irrigation from other sources	1,448 acres
Rain-fall	24.94 inches

Crops grown (Area)

Rice	4,206 acres
Wheat	5,232 acres
Gram	5,441 acres
Jowar	1,300 acres

Bajra	2,717 acres
Sugarcane	2,640 acres
Cotton	2,568 acres

Communications

Roads:

(*a*) Metalled	10 miles
(*b*) Unmetalled	20 miles

Principal Towns, Industrial Centres, and Markets

1. Naraingarh	Population is 4,196.
2. Shahzadpur-cum-Marja	Population is 4,538.
3. Raipore Rani	Population is 2,435.

Medical Services — There are dispensaries at Naraingarh, Shahzadpur, Raipore Rani and Morni.

Education — Four high schools; 3 middle schools; four lower middle schools; and 23 primary schools.

Animal Husbandry — Condition of animals is very poor, there is only one veterinary hospital at Naraingarh.

Small-scale and Cottage Industries — Handloom weaving, tanning, and shoe-making.

Thanesar Block

This Block comprises 167 villages of the Thanesar Tehsil of Karnal District, and has an area of 1,69,424 acres and population of 68,000. The land is divided into two main categories: The Khadir riverain tract, and Banjar or up-land plain. The area is well-wooded. The land is fertile, and studded with clusters of trees. The palm trees are plentiful in the Khadir; grasses grow in the Banjar. When the Jamuna is in flood, and other hill streams are also swollen, considerable damage is done to crops. The general character of population is the same as in other parts of Karnal district. Some more information about the Block is given below:

Population (1951 Census)

Urban	17,518
Rural	49,630
Displaced settlers	18,522

Land Utilisation and Irrigation

Sown area	56,933 acres
Current fallows	15,058 acres
Culturable waste	74,313 acres
Unculturable land	23,087 acres
Forests	Nil
Irrigated area :	
(*i*) Canal irrigated	1,788 acres
(*a*) Perennial	Nil
(*b*) Non-perennial	1,788 acres
(*ii*) Well irrigated	11,160 acres
(*iii*) From other sources	Nil
Rainfall	21.37 inches

Communications

Roads :	
(*a*) Metalled	37 miles
(*b*) Unmetalled	38 miles

Principal Towns, Industrial Centres, and Markets

1. Thanesar — Population is 11,272.
2. Ladwa — Population is 6,246.

Medical Services There are 3 dispensaries.

Education Ten primary schools; one middle school each for boys and girls; 2 high schools for boys; and one high school for girls.

Animal Husbandry There are 24 pedigree bulls.

Small-scale and Cottage Industries None of importance.

Tarn Taran Block

One hundred and fifteen villages of Tarn Taran Tehsil of Amritsar district, with an area of 1,14,434 acres, and population of 91,000 are included in the Community Project Programme. The Tarn Taran Tehsil abuts on the Beas. The land is continuous level plain, unbroken by any undulations, and dotted with clusters of mudroofed villages.

The soil is a light reddish yellow loam. The formation is distinctly alluvial. The people are mostly Jats. The Manjha Sikh Jats are the finest of the peasantry, and among them are men who in any country in the world would distinguish themselves for their fine physique. They are tall and muscular, with an erect carriage and handsome features. They are frugal and industrious, and though not intellectual possess considerable shrewdness. They are, however, litigious and stubborn. The Hindu Jats mostly follow the Sikh customs. The houses are built of sun-dried bricks or of large clods of caked mud taken from the bottom of a pond. Those of the village menials, whose trade or habits are unobjectionable, live within the village site. But Sweepers and Chamars have separate *abadies* for themselves at the out-skirts of the villages. The daily life of the people is one continuous round of labour. Canal irrigation has, however, made some difference in the case of the well-to-do farmers, who enjoy occasional respite from hard work. Nearly all the available waste land has been broken up, and grazing is scarce. The care of cattle is, therefore, monotony itself. Breaks in the round of labour are few for the men, and still fewer for the women. Other informaion of interest about the Block is given below:

Population (1951 Census)	
Urban	Nil
Rural	91,148
Displaced settlers	19,276
Land Utilisation and Irrigation	
Sown area:	1,04,260 acres
Current fallows	6,776 acres
Culturable waste land	11,192 acres
Unculturable land	14,704 acres
Forests	1,388 acres
Level of water table	30 feet
Irrigated area:	75,447 acres
(*i*) Canal irrigated	44,372 acres
(*a*) Perennial	44,372 acres
(*b*) Non-perennial	Nil
(*ii*) Well irrigated	31,075 acres
(*iii*) From other sources	Nil
Rainfall	21.76 inches

Crops grown (Area)

Rice	8,951 acres
Wheat	30,455 acres
Gram	3,597 acres
Maize	4,873 acres
Sugarcane	2,836 acres
Cotton	6,827 acres

Communications

Roads :

(*a*) Metalled	18 miles
(*b*) Unmetalled	36 miles

Principal Towns, Industrial Centres and Markets

Medical Services	Two civil hospitals; one rural dispensary.
Education	Two high schools ; three middle schools for boys, and one for girls ; 28 primary schools for boys, and 3 for girls ; 2 primary co-educational schools.
Animal Husbandry	Two veterinary hospitals ; 3 outlying veterinary dispensaries.
Small-scale and Cottage Industries	Handloom weaving, shoe-making.

Kulu Project

The Development Block consists of 130 villages with a population of 30,000, scattered over 47 Phatis of varying altitudes in the Kulu sub-division—the picturesque plain nestling below the Inner-Himalayan-Lahaul-Spiti zone. The bulk of the Block is situated in the main Beas valley, and stretches from Bajaura to Manali. A small part of it extends over a portion of the Parbati Valley, which is also known as Rupi valley, and another portion lies in the Sarwari valley which joins the main Beas valley at Dhalpur (Kulu town).

The area is rocky, and at most of the places the land is very steep, with ever-present menace of soil erosion. The height of the Phatis varies from 4000 feet to 7000 feet. Certain parts of the area remain under snow during winter. The area under cultivation is

limited to a fraction of the total land available, while the rest of the area is covered by forests, mountains, or waste land. The area being mountainous farming on large scale is not possible.

The chief kharif crops grown in this area are maize, rice, mash, kodra, potatoes and sariara, while the main rabi crops are wheat, barley and sarson. The means of irrigation are very poor in the whole of this sub-division. In the lower part of the Development Block there are a few wells which, however, are very rarely used for irrigation purposes. These are primarily a source of supply of drinking water. A major part of the area under cultivation depends on rainfall. The irrigated land, called Ropa, derives water from small canals known as Kuhls, which are taken out of neighbouring *nallahs* and *khads*. The existing *kuhls* are not regular ones, but are torrent-fed, and run during the rainy season only. These *kuhls* are generally damaged when there is flood in the feeder *nallahs* and *khads*.

There is no railway in the whole of this sub-division. There is an airstrip at Bhontar which, however, cannot be used for commercial purposes because the formation of the hills makes it difficult for a pilot other than an expert to land safely. Thus the only means of communication is the roads. There are three main categories of roads which run through the area: motorable roads ; bridle roads ; and foot paths. There is only one motorable road running from Manali to Bajaura en route Mandi. It is the highway of the valley, and 33 miles of it fall within the Development Block. With the exception of a few miles, the road is unmetalled throughout. The following are the main bridle roads :

1. Bridle road connecting Kulu with Manali on the left bank of the Beas—total length about 23 miles.
2. Bridle road connecting Bhontar with Shat en route Manikarn—total length upto Shat 10 miles.
3. Bridle road connecting Kulu with Rujag en route Joginder Nagar over Bhabu pass ; a portion of this road, about 6 miles long along the Sarwari Nallah, falls within the area of the Development Block.

The foot paths are innumerable. They usually connect a village *abadi* with the main motorable or bridle road, or they connect

one village with another. The means of transport are not at all satisfactory, and require lot of improvement. Poor communications are one of the main factors responsible for the backwardness of this area.

The health of the general population is below the usual norm. This is mostly due to the extreme poverty and consequent mal-nutrition. It has been estimated that over 20% of the population suffers from venereal diseases. At present there is a civil hospital at Kulu, rural dispensary at Naggar, two Ayurvedic dispensaries at Bhuthi and Bhontar, a Mission hospital at Manali, and a team of doctors at Kulu for treating venereal diseases. These medical facilities are, however, inadequate. Houses in the villages are dirty. Ventilation and light arrangements are very poor. In the majority of houses the living rooms are shared by the cattle also. Although nature has been bountiful in providing flowing streams, scarcity of clean drinking water is felt everywhere. At most of the places people get water from the streams, which causes many ailments. The natural springs are not properly protected with the result that water available from these is also not as pure as it should be.

In the matter of education the area is utterly backward. Only about 3% of the population is literate. There is no college in the entire area. There is one high school, 3 middle schools for boys, one middle school for girls, two lower middle schools, and ten primary schools.

The chief raw materials produced in Kulu valley are fruit, wood, wool, and herbs. The only raw material which, however, has to some extent been exploited for industrial purposes is wool. *Shawls*, *pattus* and other products of wool are manufactured, and constitute the chief cottage industry of the valley. Bee-keeping is another important cottage industry of this area. There is a government bee-farm at Katrain which also provides instruction in bee-keeping.

CHAPTER 6

PROBLEMS OF HILL AREAS

On account of temperate climate, heavy rain and snowfall, altitude, and comparatively poor soil deficient in minerals, the problems of the hill areas are in many ways different from those of the plains. It is by centuries of hard work that the hill-man has developed his terraced fields and protected them against erosion. As such, soil conservation must be given top-most priority in development programme for the hills. Increased irrigation facilities are only possible by building more *kuhls*. Wherever *kuhl* making is possible it should be undertaken. Lack of communications is one of the major problems of the hill areas. It is easy to build kacha roads, but difficult to conserve these against the erosive action of rain. Hence *kacha* roads should only be built in areas where they are very badly required, and where they can be metalled. Usually bridle roads should serve the purpose. Other subjects on which emphasis should be laid are development of horticulture, bee-keeping, poultry farming, cottage industries, such as spinning and weaving of wool, improved housing, personal hygiene, environmental sanitation, education, and encouragement of tourism.

Horticulture

The climate and soil of Kulu Valley are ideally suited for fruit culture, particularly for apples. At present there are only 350 acres of land under orchards. It is proposed to bring an additional area of 1,000 acres under apple cultivation. Apart from cash sale of plants on no-profit no-loss basis, plants are also given as taccavi loan in kind. Areas which were suitable for planting were surveyed and selected. Villagers were also encouraged to plant fruit trees near their houses. Gardening tools, such as pruning knives, spray pumps, and secateurs are also given as loans in kind. Provision was also made for opening gardening classes, and apart from the Village Level Workers private persons were also encouraged to go in for this training.

Nurseries. Nurseries at Palampur and Kulu have been augmented and a new nursery has been developed at Ani in Outer Seraj.

Tea gardens in National Extension Service Block, Palampur

Building roads in the hills is an arduous job

Smokeless stove with chimney, now being popularised in hill areas

Top-working of wild and inferior fruit trees: Wild varieties of pear, cherry, apricot, peaches, and inferior apples, which are common in Kangra and Kulu valleys, can be top-worked with superior and improved commercial varieties.

Pest destruction: Adequate provision is made for destruction of flying foxes, which cause enormous damage to fruit.

Agriculture

The following improved varieties of seeds are recommended for the hill areas:

Wheat

(*i*) **C. 253** a beardless wheat, is recommended for cultivation in lower hills. It gives much higher yield than the local wheat.

(*ii*) **C. 224.** This new strain has been consistently out-yielding the local wheat at Kulu and Katrain.

(*iii*) **C. 285** is suitable for Lahaul Valley.

Rice

Out of a total area of about .5 million acres under this crop in the State, 120,000 acres are grown in Kangra District alone. The varieties recommended for cultivation are 100 *Ram Jawain*, 72 *Phul pattas* and 41 *Lal nakanda.*

Linseed

This crop has special importance in Kangra District, which has more than 50% of the acreage of the State under it. Linseed strain No. K2, which is bold-seeded, early ripening, and resistant to rust and wilt diseases, is the best variety for cultivation.

Fertilizers

Soils in hill areas are acidic. To neutralize the acid contents application of lime along with ammonium sulphate is very essential.

Improved implements

Pedal thrashers, and weeders are useful in relation to paddy crop.

Vegetable cultivation

Vegetable sub-stations are functioning at Palampur and Katrain, where suitable varieties of cauliflower, peas, potatoes etc., are being cultivated. On account of its temperate climate, Kulu Valley

is particularly suitable for multiplication of seed of European varieties of vegetables. To encourage the use of vegetables, packets of vegetable seeds were provided to villagers.

Irrigation

Construction of *kuhls* is an important item for extending irrigation in the hill areas.

Animal husbandry

Artificial insemination of sheep. Rapid improvement in the quality of wool of the hill sheep can be brought about by artificial insemination using Hissar-dale rams.

Introduction of foreign breeds of cattle: Foreign breeds like Jeyrs dwell in the temperate climate of the hill areas.

Poultry farming: For improving the diet of hill-men introduction of poultry farming is necessary. Improved breeds, such as Rhode Island and White Leg Horn, flourish very well in hill areas.

Bee-keeping: Bee-keeping in Punjab can only be successfully practised in the hill areas. At present bee-hives are kept in a primitive condition in the walls of houses. The wall-hives can be improved by providing protection against ants by cementing, and by provision of frames and sub-foundations. Honey-extractors should also be supplied to Village Level Workers, and arrangements should be made for collection and marketing of honey.

Cottage Industries

Improved spinning wheels, known as Mohni, Rani, and Wardha types are being supplied on a subsidised basis.

Social Education

Kulu Valley has a distinct culture pattern, and its preservation is being encouraged under the Community Development Scheme. Kulu dances and folk-songs are receiving considerable encouragement. The folk-songs of the hill areas have been collected and published in book form.

Community Centres and libraries are established in conjunction with the existing schools. Standardised furniture, and framed paintings dealing with the life of hill-men are supplied for decoration of the libraries.

The villages in Kulu Valley are very insanitary. Farmers are being encouraged to have separate cow-sheds for their cattle. The well-to-do villagers are persuaded to adopt glass-panes for the windows of their houses. Iron stoves are being manufactured and provided to the villagers on a subsidised basis. Prizes are given for clean houses as well as for personal cleanliness in the form of soap, hair oil, towels, mirrors, pictures etc. As Kulu Valley is an attractive area in Northern India and a number of tourists visit it, the Rest Houses for travellers are also being improved.

Environmental Hygiene

Water supply: Most of the water supply in the hilly regions is from springs which are protected, and pipe lines are fitted into the enclosures, where people fill their vessels. However, there is an appreciable number of *bowlies* which are open and villagers dip the vessels in the *pucca* pool, just outside the out-let of the spring. This practice is injurious to health. Under the Community Development Scheme care is taken to make the open *bowlies* safe and sanitary.

Health

Deficiency diseases—Rickets and Osteomalacia: Milk which is the main source of calcium for growing infants and expectant and lactating women in the plains is lacking in the hilly districts, as the milk yield of the cows is very low. Because of extreme poverty, most of the villagers sell their total milk and ghee produce leaving very little for the needy mothers and children. Even those vegetables which have a high percentage of calcium content are not produced in sufficient quantities.

Under the development schemes poultry farming and kitchen-gardening are being encouraged in all the project areas. Use of eggs and vegetables is good remedy for rickets and Osteomalacia.

Campaign against hookworms: Some parts of the hill areas as well as the sub-montane tracts are heavily infested with hookworms. Treatment of hookworm is quite simple. Administration of tetra-chlor-ethylene, magnesium sulphate and ferri-et-ammonium sulphate cures the disease. A yearly campaign in the hill areas as well as in the sub-montane areas for eradication of hookworms is desirable, and it is only by mass treatment that it can be eradicated.

Campaigns against Diseases

Campaign against venereal diseases: The population of Kulu valley is heavily infected with venereal diseases. The B.C.G. team has been doing useful work for the eradication of these diseases. There is need of intensification of this work so that the venereal diseases are totally eradicated.

CHAPTER 7

TARGETS

Targets have been fixed in the Punjab for all schemes included in Community Development Programme which admit of physical appraisal. These targets are related to budget allocations as well as to realisable possibilities within the framework of local conditions. The bases on which targets have been fixed are discussed below in broad outline :

Agriculture

Reclamation of Land

Total area that can be reclaimed within the allotted funds, plus the area that can be got reclaimed by leasing culturable waste land to small tenants and landless labourers.

Kulu Block has no scheme.

Distribution of Fertilizers

Targets have not been fixed separately for different fertilizers used. Overall targets for all types of fertilizers taken together have been worked out for areas with extensive irrigation on an average of 120 maunds per village. In the case of areas which depend largely on rainfall the scale varies from 60 to 80 maunds.

In the case of Kulu Block the target is about 23 maunds per village in view of the special conditions of the area.

Distribution of Improved Seeds

The entire area under cereals (wheat, Bajra, and other millets including maize, paddy, and gram only), cotton, oil seeds, and sugarcane would be sown with improved seeds.

Line-sowing of Cotton

On the completion of the Project period the entire area under cotton would be sown according to the line-sowing method.

Japanese Method of Rice Cultivation

At the end of the Project-period at least 10% of the total area under paddy would be cultivated according to the Japanese method.

Distribution of Improved Implements

Twenty-five percent of the agricultural families must possess at least one improved implement (as distinguished from ordinary tools) each.

Compost Pits

At the end of the project period there would be at least one compost pit per agricultural family.

Targets in respect of Naraingarh and Kulu Blocks have been fixed at a lower level on account of the special geographical and economic conditions of these areas.

Plantation of Trees

(*a*) Fruit trees: One hundred trees per V.L.W.

(*b*) Timber trees (Sheesham, Mulberry, Kachnar, Kail, Partal, Deodar, and Pine): One thousand trees per V.L.W., of which at least 10% should survive.

(*c*) Other trees: Five hundred trees per V.L.W., of which at least 10% should survive.

In the case of Kulu Block the targets for all types of trees vary from the above norms.

Model Farms

Two model farms per V.L.W. which would conform to the definition of a real model farm. These farms would maintain regular accounts in registers to be specified for the purpose.

The target for Kulu Block differs from the norm.

Demonstration Plots

Two demonstration plots per village. A demonstration plot refers to one crop period.

The target for Kulu Block is about half of the norm.

Irrigation

Percolation Wells and Tube-wells

Targets for sinking of percolation wells, installation of pumping sets and tubewells, extension of existing *kuhls*, and construction of new *kuhls* have been fixed, strictly with reference to budget allocations.

Animal Husbandry

Veterinary First-aid Centres

One centre per Village Level Worker.

The targets for the Batala Project and Kulu Block are exceptions to the norm. The Batala Project has not set apart any funds for

the scheme, while the Kulu Block has fixed its target lower than the norm on account of paucity of funds and its special conditions.

Veterinary Dispensaries Four dispensaries for Kulu Block.

The remaining areas have no funds for the purpose.

Artificial Insemination Centres One centre each in the Batala, Nawanshahr, Jagadhri, Nilokheri, Sonepat, Faridabad, and Kulu Projects.

There is no scheme for setting up these centres in other Development Areas.

Supply of Pedigree Bulls One bull for each group of villages entrusted to Village Level Workers in Batala, Nawanshahr, Jagadhri, Sonepat, Faridabad, and Kulu Projects. Two bulls per Village Level Worker in Community Blocks.

The target for Nilokheri is lower than the norm.

Supply of Improved Poultry Birds Targets have been fixed according to availability of funds.

Supply of Eggs for hatching 1200 eggs per Block.

The target for Sonepat Project is 1/3rd of the norm in view of special local conditions.

Ponds stocked with Fish No uniform basis. Only Batala Project and Tarn Taran Block have schemes of stocking ponds with fish.

Health

New Hospitals and Dispensaries One new hospital or dispensary for each of the Community Projects and Community Blocks.

Jagadhri and Sonepat Projects, and Thanesar Block have no scheme for starting new hospitals or dispensaries. Kulu would have four dispensaries.

First-aid Centres One per Village Level Workers' group of villages.

Maternity and Child-welfare Centres Three per Block of Community Project Areas.

Dai Centres One per Village Level Workers' group of villages.

Dais to be trained

One trained Dai per village in all the Community Project Areas at the end of the Project period. The target for Kulu Block is 30.

Sanitation

Drains, Streets, Wells and Latrines

No uniform basis could be adopted for fixing targets for the construction of drains, pavement of streets, re-modelling of wells, and sinking of wells for drinking water. These have been related to special conditions obtaining in development areas. Targets have been laid down for construction of model public latrines and model cattle sheds. These are one each per Village Level Workers' group of villages.

Communications

Kacha Roads

No rigid scale could be fixed. A rough basis of at least one mile of Kacha road per inhabited village has been adopted.

Pacca Roads

Targets for Pacca Roads, and construction of culverts and bridges have been related to availability of funds.

Education

Schools

No uniform norms could be fixed for the opening of schools.

Social Education

Adult-literacy Centres

Two centres per Village Level Workers' group of villages.

The target for Kulu Block is a little lower.

Community Centres

One per Village Level Workers' group of villages.

Reading Rooms

One per Village Level Workers' group of villages.

Community Radio Sets

One per Village Level Workers' group of villages.

Women's Organisations

One per Village Level Workers' group of villages. The target for Kulu Block is much smaller.

Children's Parks

One per Village Level Workers' group of villages.

Young Farmers' Clubs

One per Village Level Workers' group of villages.

Cooperative Societies

One Cooperative Society per village is the target. Of these at least one society per block must be a Cooperative Marketing Society.

In the case of Kulu Block the target is smaller.

II

PEOPLE AND THE PROGRAMME

CHAPTER 8

PEOPLE'S PARTICIPATION IN COMMUNITY WORK

People's participation in the community work is co-extensive with the entire programme, and as such needs careful planning at all stages. There are special organisational problems of participation at the planning and implementation stages, of students' participation, of women's participation, of participation by organised non-official agencies etc. These have to be studied and solved before community work can get into stride. The question of People's Participation has been discussed at length in various conferences on Community Projects. At the second Development Commissioners' Conference held in April, 1953, the matter was studied in its various aspects. The recommendations made were important and are, therefore, reproduced briefly:

(*a*) In order to establish a suitable organisation to ensure participation of the villagers at the planning stage, State Governments should set up Project Advisory Committees consisting of (besides the principal officers) leading public workers, a few representative agriculturists, representatives of the District Boards, members of Parliament and State Legislature, representatives of multi-purpose cooperative societies, members of Bharat Sewak Samaj, and leading social workers. This pattern should ultimately be reproduced in the Blocks and villages. It will be through this machinery that targets of production and the pace of development will be proposed by the people, and implementation of the Programme ensured.

(*b*) In the constitution of village councils, maximum use should be made of existing institutions, like local boards, cooperative societies etc. Only where there is vacuum of local organisations, or where existing organisations cannot be used for community purposes, a new body should be created. It is obvious that a new series of organisations under official sponsoring is not an abiding

method of ensuring popular participation in community development.

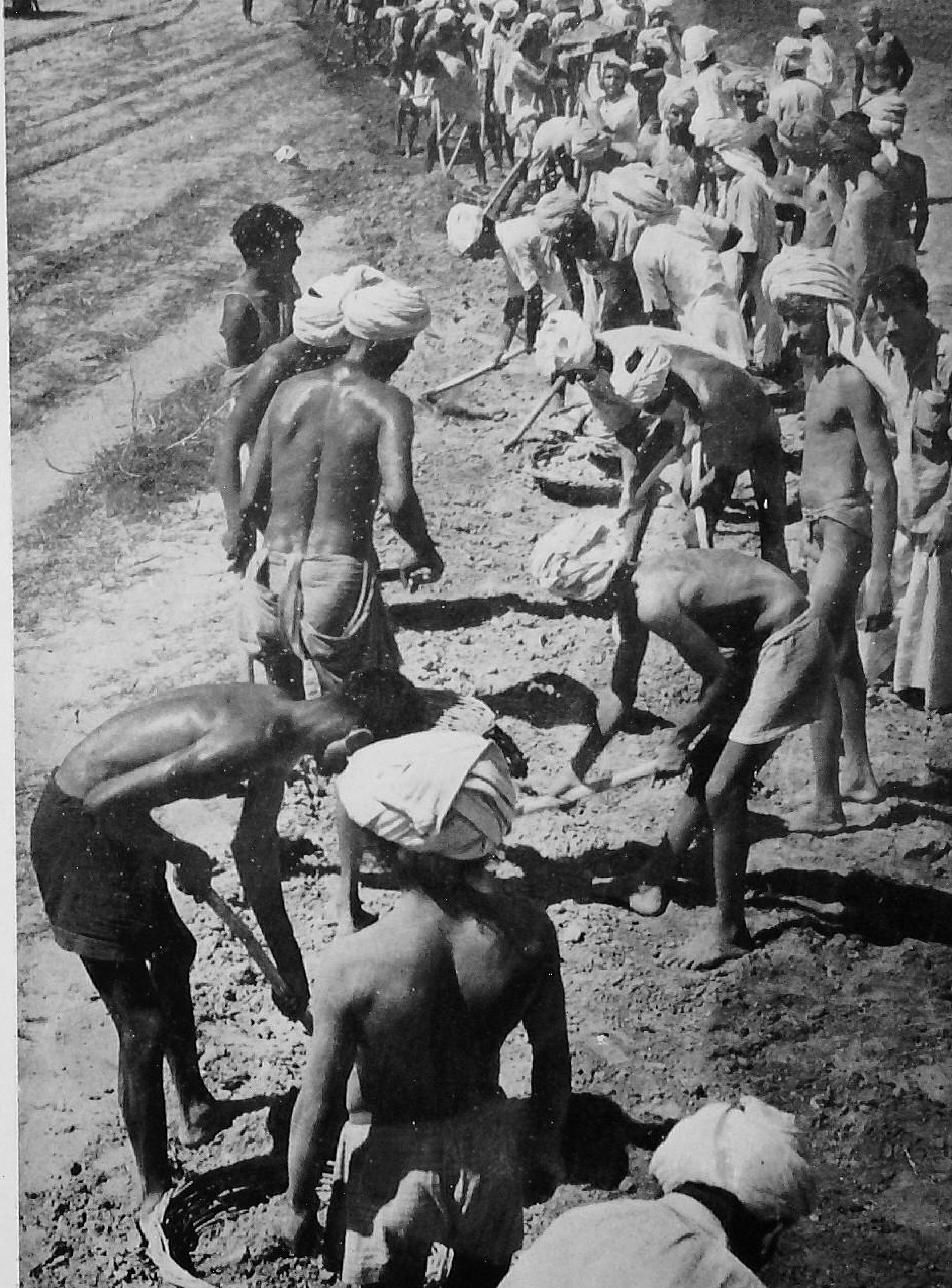
(*c*) In securing participation of the villagers for the execution of the Programme, the Community Projects Organisation is to receive maximum support from Bharat Sewak Samaj. The States should keep themselves in touch with the State Conveners of the Bharat Sewak Samaj.

(*d*) With a view to giving fillip to community interest in the Programme, State Governments should organise students' camps during the vacations of schools and colleges. It should also be considered whether the development programme can find place in the text books.

(*e*) Teachers can form the nuclei of village leadership, and can act as permanent functionaries, in addition to the Village Level Worker, for carrying out the Programme. The old prestige of the village teacher should be restored. State Governments should also consider as to how best he can be linked integrally with the development work, and to what extent material incentives should be given to him to secure his fullest cooperation.

(*f*) In order to enlist women's participation it is necessary to introduce such programmes in the project areas as would awaken their interests and revitalise and restore womanhood in society to the status it once occupied. In the field of sanitation and hygiene women can set and maintain the pattern visualised. They can also function as very good teachers.

(*g*) Camps of farmers should be organised for the work of tree planting, draining of water-logged areas, and other land development operations. Removal of Hyacinth from irrigation channels, clearance of weeds, desilting of irrigation tanks, campaigns against epidemics of plant diseases and insect pests are some of the other items of work for which voluntary labour should be mobilised. The campaigns and drives should be programmed for the slack season.



People's participation

Members of a students' camp

Students working with villagers

(*h*) Non-official agencies and persons, such as doctors, lawyers, teachers, technicians, social workers, artists, and various educational and other associations, should be drawn into the work through propaganda and material encouragement.

At one stage it was decided to adopt the principle of a qualifying scale for voluntary contribution in the form of either money or labour, as a condition precedent to undertaking development schemes. Later, however, the decision was modified, as it was felt that the application of rigid conditions in the initial stages would hamper the Programme. The acceptance of the underlying principle, however, shows the importance attached to self-help from the very beginning.

Minimum Standards

The Community Projects Administration, Government of India, have laid down broad standards with regard to People's Contribution, which may be in the form of cash or kind or voluntary labour. These are as follows:

(*a*) *Irrigation:* The percentage contribution should be fairly large in view of the fact that the bulk of the expenditure consists of labour costs.

(*b*) *Drinking water supply and drainage:* About fifty percent of the expenditure should be contributed by the villagers.

(*c*) *Roads:* *Kacha* roads should be built by the villagers at their own cost, while culverts and *Pacca* roads would be constructed with Government aid.

(*d*) *Education:* About one-fourth of the cost of additional buildings should be contributed by the villagers.

(*e*) *Dispensaries:* Twenty-five percent of the cost of additional buildings should be contributed by the villagers.

(*f*) *Recreation Centres:* Half of the capital cost should be contributed by the villagers.

People's Contribution

The enthusiasm with which community work has been hailed in the Punjab may be gauged from their voluntary contributions which amounted to over Rs. 265 lakhs upto the end of March 1955, in the form of cash donations, labour and donations of buildings and land. This includes Rs. 38·94 lakhs for irrigatior and water-supply schemes, Rs. 25·38

lakhs for schools and educational institutions, and Rs. 17.08 lakhs for Community Recreation Centres, Young Farmers' Clubs etc. The contribution for Health and Sanitation works out to Rs. 24.17 lakhs. Value of land and labour contributed for roads amounts to Rs. 113·98 lakhs. About Rs. 13.86 lakhs were donated in various forms for other development work.

CHAPTER 9

STUDENTS' AND YOUTH CAMPS

The idea behind students' and youth camps is to inculcate spirit of service and dignity of labour among the youth, to bring the students from urban areas in touch with rural life so that there could be greater mutual understanding, and to help in the execution of local development projects. The Planning Commission provided one crore rupees for the organisation of these camps under the first Five Year Plan. The Ministry of Education, Government of India, prepared the Scheme. A special committee consisting of representatives of the Bharat Sewak Samaj was constituted to draw up all the details of work and to supervise the implementation of the scheme.

It was decided that the camps would be of two main types: (*i*) Students' camps, and (*ii*) Youth Camps. The students' camps are confined to students in schools and colleges, while the youth camps consist wholly of non-students, *i.e.*, those who have been students at some stage or the other and are either in employment now or looking out for jobs. The youth camps might also include village youngmen between the ages of 15 and 25. In the case of students' camps, it was decided that the best time for holding these was soon after the annual examinations and during the long summer vacations. Youth Camps can be held at all times of the year.

Categories of Camps

Students' Camps and Youth Camps fall into three categories:

(*i*) **Permanent camps.** It is proposed that these camps should remain open throughout the year. Batches of students should go to these for a period of four to six weeks, and carry out specific items of development works.

(*ii*) **Boys' Camps.** These camps are to be organized by educational institutions. The Bharat Sewak Smaj would be associated with these closely; and their local branches

would assume full responsibility for the "*Shramdan*" work. Where local educational authorities do not take the initiative to organise these camps, the Bharat Sewak Samaj will initiate the work of their own. Students' camps can have an admixture of non-students, preferably from among local village youths, who would live in the camps, and participate in all activities.

(*iii*) **Girls' Camps.** These would be organised for girl students and young women under the guidance of experienced ladies, social workers, and educationists. These camps would be exclusively for girls and women, and would concentrate on environmental service and improvement in personal and home-life of women and children in the villages. Non-student village girls with some education and intelligence may also be admitted to the camps.

Age and Education of Participants

The age of those joining the camps should normally be between 15 and 25 years. In the case of students they should be studying in high schools, colleges, or training institutions. In the case of non-student youths from villages, they should have studied up to the middle standard and be able to participate in discussions.

Financial Assistance

The camps are to be subsidised by Government of India on the following terms:

(*i*) Rs. 1/8/- per day for each camper towards boarding charges. Government deeply desire that the campers should be given good and wholesome food to keep fit to do hard manual work and stand the rigours of the weather. Local gifts in the form of grains, vegetables, milk products etc. may be accepted.

(*ii*) 8 annas per day for each camper towards camp organisation and incidental charges, which will include the cost of sanitation, water-supply, lighting, and payment to cooks, transport of materials etc. Voluntary help of villagers for transport and other services may be encouraged and secured.

(*iii*) Third class Railway fare or actual bus charges from place of residence to camp site.

(*iv*) The same rates will also be paid to the camp organisers and those in charge of instruction, recreational items, and general management.

(*v*) A proper Budget should be framed indicating the items of expenditure under each head, which will be met from the funds sanctioned by Government. This should be submitted along with the application for grant.

(*vi*) The Ministry of Education have also agreed for the payment of the above grant in advance.

Strength

The minimum and maximum limits within which the membership of a camp should lie have been prescribed. The number of campers should be between 50 and 100 excluding the organizers and helpers. If there are more students or youths desirous of participating in the camp additional units should be organised.

Essential Features

Each camp must have a concrete programme of work and service. The necessary sanction for the project should be there before the camp starts functioning. All arrangements about tools, materials, labour etc. should be completed before the campers assemble. The requirements of the campers, such as sanitation, water supply, accommodation etc., should receive careful attention at the planning stage. Regular cultural and recreational programmes should be organised so that the villagers can benefit from the camps in full measure. A programme of lectures should be prepared so that the campers are initiated properly into the spirit of the work they have to do. The question of developing leadership should receive special attention.

Certificates to Campers

At the termination of the each camp certificates would be given to the participants. Each camper must put in at least four hours manual work and two hours of village contact and service, and two to three hours in study and discussion, daily.

Students' Camps in Punjab

Students' camps were held in community areas in 1954 during the summer vacations of schools and colleges. The duration of these camps was about three weeks on the average. Project Block Officers drew up the programme of work for the campers in consultation with representatives of the Bharat Sevak Samaj. Necessary tools and implements were provided to the campers, and technical supervision was made available by the technical staff attached to the Project Blocks. A model daily routine time-table was recommended for adoption by all the camps, and they were permitted to make such alterations in it as they considered necessary. This time-table is as follows:

4—0 A.M. to 4—30 A.M.	Rising bell.
4—30 A.M. to 5—0 A.M.	Light refreshment and tea.
5—0 A.M. to 9—30 A.M.	Manual work/sanitation service in villages as per scheme. (With an interval of half an hour for breakfast).
9—30 A.M. to 11—0 A.M.	Bath and wash.
11—0 A.M. to 12—0 Noon.	Study class.
12—0 Noon. to 1—0 P.M.	Mid-day meal.
1—0 P.M. to 3—0 P.M.	Compulsory rest.
3—0 P.M. to 5—0 P.M.	Lectures, discussions and programme planning.
5—0 P.M. to 7—0 P.M.	Village visit, talks on National Plan and planning. Also organising youth club, and children's play centres.
7—0 P.M. to 8—0 P.M.	Evening bath and meal.
8—0 P.M. to 10—0 P.M.	Village cultural and recreational programme—*bhajans*, music, drama etc.

The camps were inaugurated by the Ministers, high officials, and important public men.

In Amritsar district three camps were organised at Atari, Tharu, and Palasaur, respectively, from the 30th August to the 20th September. The camps at Atari and Tharu were boys' camps, and the camp at Palasaur was the girls' camp. In Ferozepur district the camps were located at Mehna, Rode, and Saline. The first two were boys' camps, and the third girls' camp. These lasted from the 26th August to the 15th September. In the Jullundur district three camps were organised from the 26th August to the 15th September

in the Nawanshahr Project. These were located in Aur, Mukandpur, and Naura villages. The first two were boys' camps, and the third was girls' camp. In Ludhiana district three camps were organised in the Samrala, Ghulal, and Sidhwan Khurd villages. The first two were boys' camps and the third was girls' camp. In Hoshiarpur district two boys' camps were organised in Una and Santokhgarh villages in the Una Development Block. In Kangra district four camps were started in the Kulu Block. These were located at Naggar, Manali, Budhwar, and Kulu. The first three were boys' camps, and the fourth girls' camp. The first two lasted from the 5th August to the 25th August, and the last two from the 25th August to the 15th September. In the Ambala district three camps were organised, two in Jagadhri Project and one in Kharar Block. All these were boys' camps. They started functioning from the 25th August, and extended till the 1st September. In Karnal district one camp was started in Nilokheri and two in the Thanesar Block in Pehowa and Sharifgarh villages. The camps at Nilokheri and Pehowa were boys' camps and that at Sharifgarh was girls' camp. In Rohtak district two boys' camps and one girls' camp were started in the Sonepat Project. These were located at Murthal, Gannaur, and Rohtak. The camp at Rohtak was girls' camp. In Hissar district the boys' camp was started at Hansi in the Hansi Block. In Gurgaon district three camps were organised in the Faridabad Project—two boys' camps at Tigan and Daulatabad, and one girls' camp at Sukhrali.

All the camps achieved a large measure of popularity, and did very useful work.

III

CONSOLIDATION OF HOLDINGS

CHAPTER 10

CONSOLIDATION OF HOLDINGS SCHEME

A reference to Consolidation of Holdings Scheme, which is in operation in the Punjab, is necessary in relation to Community Projects work. This scheme is not a part of the Community Projects scheme, but it has been seen that the Community projects programme yields best results if areas which have been consolidated are taken up. Consolidation of holdings provides a solid base for rural development. On his consolidated holding the farmer can sink a well with the aid of loan money, and he can grow an orchard which he can also fence economically. Apart from consolidating the holdings of the farmers, the Scheme provides a unique opportunity for planning the countryside, which includes planning of educational institutions, hospitals and dispensaries, and of communications. The village community on the whole benefits as reservations of land are made to provide finance for common purposes. Pieces of land are also reserved for community buildings, such as Community Centres, Schools, Hospitals, places of worship, and play grounds. Above all, straight roads are provided to the village *abadi* as well as to the entire cultivated area. While the roads are demarcated by the staff engaged in consolidation of holdings, earth work is provided by the villagers under the guidance of Community Project staff.

Disadvantages of Fragmented and Scattered Holdings

The disadvantages of fragmented and scattered holdings, which are a legacy of the past, are too well-known to the farmers. It is a wasteful method of land utilisation and many improved agricultural practices cannot be adopted. A farmer owning 3 to 4 acres may have his holding scattered in 10 to 15 tiny bits of land. In many cases there are such narrow strips of land that it is difficult for bullocks even to plough the land, as sufficient space is not available for easy movement and turning. A good deal of time and energy of the farmer and his bullocks is wasted in moving from one plot to another. It has been estimated that the expenditure for cultivation of land increases by 5·3 per cent for every 500 metres of distance for manual labour and ploughing. A good deal of land

is wasted in embankments and field boundaries. It has been estimated that income after consolidation rises by at least 25 % even when there is no change in the technique of cultivation. Canal irrigation is practically an impossibility on scattered plots. A tube-well or a well cannot be economically sunk. Tractor cultivation on tiny bits of land is precluded. Scattered holdings are a source of quarrels among villagers, who spend their hard earned money on boundary disputes, and disputes resulting from cattle trespasses. Fencing of scattered pieces of land is an impossibility, and small boys of farmers instead of attending schools spend their time in preventing cattle from trespassing into their fields. Farmers in Punjab fully realize the handicaps of scattered and fragmented holdings, and no propaganda is needed to convince them of the benefits of the Consolidation of Holdings Scheme.

Consolidation of Holdings under the Cooperative Department in Joint Punjab

Consolidation of holdings was started in the joint Punjab by the Cooperative Department in 1920. At that time it was taken up in odd villages at the request of the people. The villages under operation were, therefore, generally scattered. The officers and other supervisory staff had to cover vast distances before they could reach their scattered units of workers. The consent of each landholder was also necessary before any scheme of redistribution could be implemented in any village. The progress was consequently slow, and the area consolidated under this scheme in thirty years' time was 7 lakh acres which is less than the average area of a district. The Cooperative Department, however, did pioneer work in making the farmers consolidation minded.

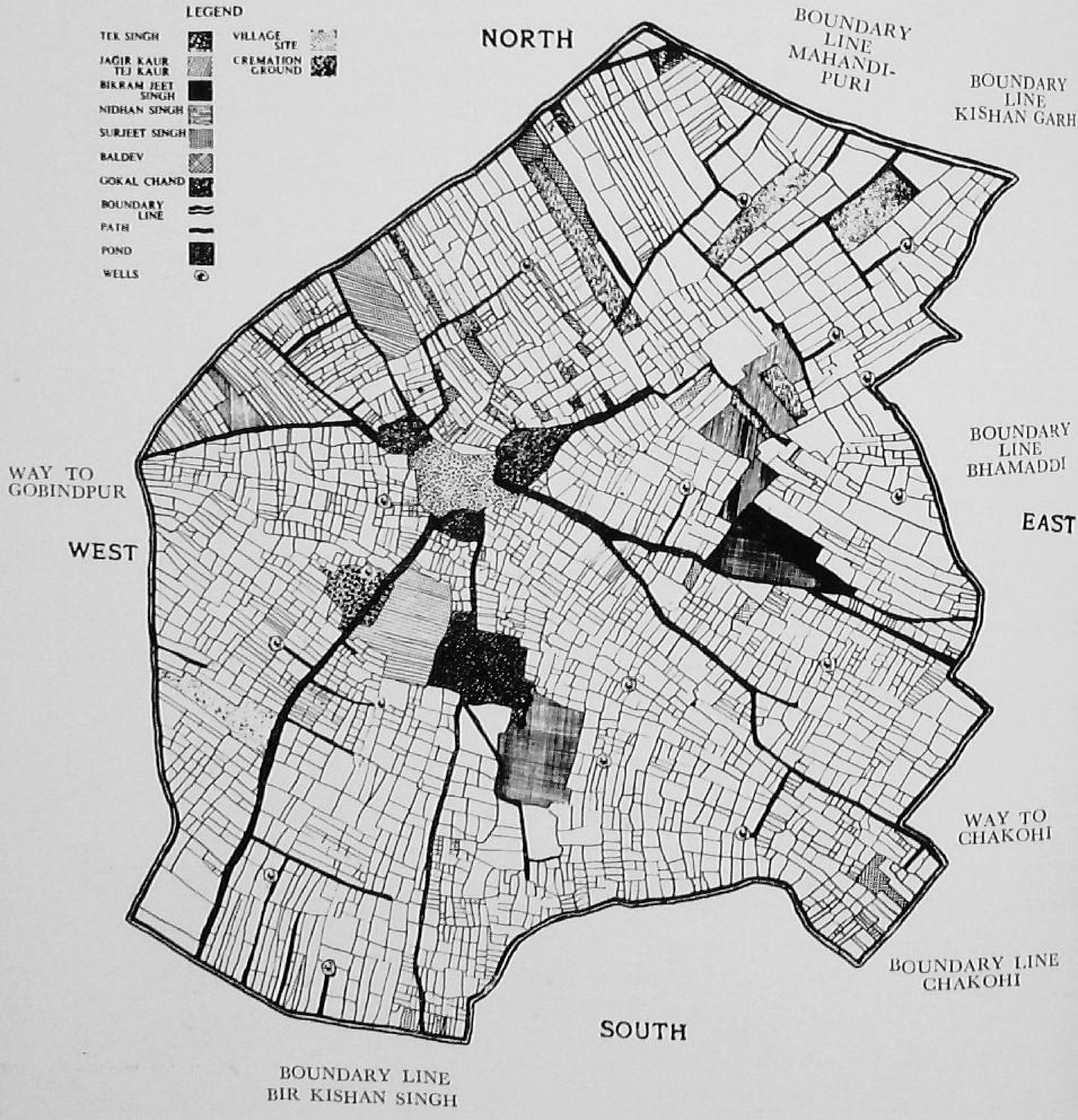
The New Act

To speed up the work, the East Punjab Holdings (Consolidation and Prevention of Fragmentation) Act, 1948, was passed early in 1948. The main features of the new Act were that consolidation could be taken up both on Government initiative and on the application of the right-holders of a village, and that compensation was provided for allotments of lesser value than the original holdings. A new Department of Consolidation of Holdings was created on April 1, 1949, to implement this scheme. But as practically the entire Consolidation Staff was at the time deputed for resettlement and rehabilitation work, the actual operations under

MAP OF VILLAGE GHUNGRALI

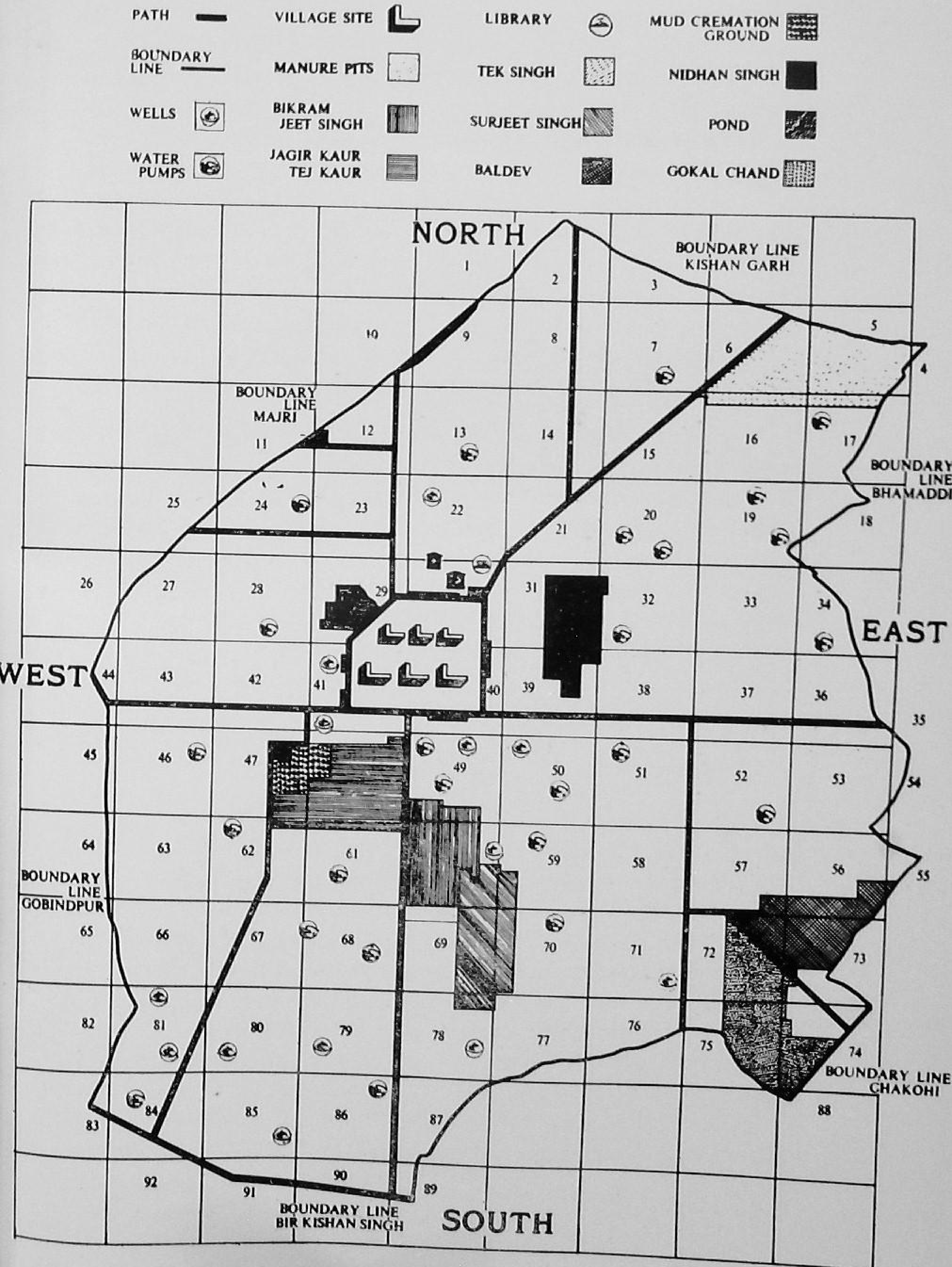
TEHSIL SAMRALA – DISTRICT LUDHIANA

(BEFORE CONSOLIDATION)



MAP OF VILLAGE GHUNGRALI TEHSIL SAMRALA - DISTRICT LUDHIAN

(AFTER CONSOLIDATION)



the new Act started only after March, 1950. 383 villages were taken up for the purpose by the end of December, 1950. The demand for Consolidation was, however, so large that the position had to be reviewed in January, 1951, when it was decided that the Revenue and Consolidation Departments should merge together. Under the new arrangements one tehsil in each district was taken up for intensive work, and the time limit for completion was fixed at 2 years. The number of patwaris was increased so that each patwari had only two villages or 1,600 acres under his charge. The Supervisory staff was also suitably increased. The Deputy Commissioners were made responsible for the work in their districts; and for this purpose Settlement Officers were appointed to assist them. The target fixed for finishing the entire work was 8 years.

Considerable progress was made as a result of the above measures; but it was felt that there was need for exploring other ways for accelerating the work further. The whole question was studied carefully, and a revised scheme adopted. The State was divided into "A" and "B" Group Tehsils. Tehsils having no Survey Rectangles were put in the former category, while those having these Rectangles were put in the latter. It was decided to complete the work of Consolidation in A Group Tehsils in a year each. Kangra and Simla districts being hilly, were left out. Work in 40 out of the 47 tehsils to be consolidated was scheduled to be completed by August, 1957, while in the remaining 7 it was to be finished a year later.

Revised Scheme of 1952

The total area of the Punjab is roughly 1,93,00,000 acres. Out of this, about 1,50,00,000 acres are to be consolidated, the remaining land being either hilly or already consolidated earlier by the Cooperative Department. A fee of Rs. 4 per cultivated acre, recoverable in two equal instalments along with land revenue, has been levied to meet the cost of consolidation. An extra charge of Rs. 2/8/- per acre is leviable if land owners do not erect the *watts* of *killas* and rectangles themselves. The total cultivated area to be consolidated is approximately 1,15,00,000 acres, and the fees would amount to about Rs. 4,60,00,000. Government will contribute an annual grant of Rs. 10 lakhs subject to a maximum of Rs. 80 lakhs for the entire scheme.

The important preliminary before a village is taken up for consolidation is to bring the revenue record up-to-date. As such, all mutations must be entered in the record so that the entire holding to which a proprietor is entitled is determined. A village proposed to be taken up for consolidation is, in the first instance, notified under Section 14 (1) of the East Punjab Holdings (Consolidation and Prevention of Fragmentation) Act, 1948, and a Consolidation Officer is appointed. The Patwari in charge of the work takes over the entire land record of the village, and prepares a map incorporating all the changes in the field numbers that have taken place since the last Settlement. The Kanungo carries out the preliminary attestation of the Shajra Nasab and Jamabandi, and the Patwari records all mutations. An alphabetical list of right-holders, and another of field numbers are also prepared.

How a village is consolidated

When the papers are complete, an Advisory Committee representing the land-holders of the village is appointed to assist in consolidation. This assistance is very useful in view of this Committee's knowledge of the conditions in the village, its land and its future needs. With the assistance of this Committee the consolidation staff proceeds to classify and evaluate the land.

Advisory Committee

The Consolidation staff with the help of the Advisory Committee work out the classification of land, and evaluate individual fields. This valuation is entered in the list of field numbers and *Khatauni Ishtemal*. This valuation is really the corner stone of the consolidation work. If a person's land has been correctly evaluated, the chances are that he will not gain or lose much in the proceedings which are to follow. If any land is given a higher value than it deserves, the owner stands to gain but no one will come forward to take it at that value. On the other hand, if a piece is given a lower value the owner stands to lose, and at the time of redistribution there will be scramble for it because it will be considered very good for its price.

Valuation

When the valuation is complete the village is measured, and rectangles and their rectangular subdivisions, one acre plots, the *killas*, are laid out. A register of right-holders is then prepared showing in a consolidated form the total land of each right-holder in the village along with its value. The Consolidation

Killa-bandi

Officer now determines the compensation to be paid for wells and trees as also the pro-rata cut for lands set apart for common purposes.

Reservation of Land for the Community

Common needs of the villagers are many. The rules allow for the reservation of land for each of the Community needs, present or future, because it is the best opportunity for such provision, and also because it is very much a question now or never. In the first place roads are provided, a circular road around the village, and roads linking the village with every individual plot with the main arteries of communications. Space is also provided for the extension of *ahodi*, for manure pits, Community Centre, *Janj Ghar*, dispensary, veterinary centre, school, children's park, play ground, theatre, market, and *mela* ground. In addition, there is a provision for the reservation of a plot of land for the Panchayat to provide income for common purposes. The size of this reservation varies with the total area of the village on the following scale:

500 acres	—	15 acres
1000 acres	—	20 acres
2000 acres	—	30 acres
5000 acres	—	50 acres

In consultation with the Advisory Committee a scheme of redistribution of the village land, called the scheme of partition, is then drawn up. Without specifying the individual fields of each right-holder, it lays down the broad principles for the re-allotment of holdings.

Publication of Scheme

This scheme is challengeable by everybody concerned which can be done before the Consolidation Officer within thirty days of the proclamation publishing it. If any objections are accepted by the Consolidation Officer the amended scheme is republished, and objections are invited again. Otherwise the Consolidation Officer forwards this scheme to the Settlement Officer for confirmation.

Pass Book

Every landholder is now given a pass book which like the ordinary bank pass book contains an account of all his rights and interests in the land in the Village, and their valuation. Later, at the time of re-partition the fields allotted to him are also entered in it and he knows independently of official records whether he has got his due or not.

Repartition

The work of repartition is taken up in consultation with the Advisory Committee as soon as the scheme is confirmed by the Settlement Officer, and the fact publicised. Allotments are made on the basis of valuation of *killas* done by the Patwari. The major portion of the land owned by a right-holder forms the nucleus of his new plot, and in cases of clash either lots are drawn or the right-holder with a higher percentage of his original holding is retained. The Consolidation Officer announces repartition on the spot, and arranges for the transfer of possession. He also prepares the file of redistribution of land revenue in respect of the new holdings. The right-holders can, within 15 days, file a written objection with the Consolidation Officer against the repartition, and appeal to the Settlement Officer against the order of the Consolidation Officer within 30 days of his order. A second appeal lies to Government within 60 days of the order of the Settlement Officer. The records are finally attested by the Kanungos, Assistant Consolidation Officer, and Consolidation Officer, and consigned to the record room. A year after repartition and transfer of possession the Patwari takes up the work of preparation of the *Misal Hadiyat*, which is based on *Khatauni Paimaish* and such changes as may come to notice during the two harvests following repartition.

Road Plan

The Consolidation of Holdings Scheme provides a unique opportunity for building intra-village, inter-village and inter-tehsil roads. All the fields in the village are made accessible to bullock-cart traffic, thus enabling the farmers to carry fodder and crops to their homes, without the discomfort and drudgery of carrying bundles on their heads. All around the village *abadi* site a circular road called the *Phirni* is provided. Attention is also paid to inter-village, inter-tehsil, and inter-district communications. The Settlement Officers (Consolidation) are asked to draw road plans in consultation with the Executive Engineers of the Public Works Department so that the largest number of villages, which previously had poor communications, could be linked up with important towns and metalled roads. This development galvanises the economy of the villages concerned. The villagers can now market the produce with facility, and a large number of them purchase bicycles. Road-planning, which is an integral part of the Consolidation of Holdings Scheme, thus stirs the stagnant economy of the villages and also indirectly stimulates industry.

Home-steading

Most of the problems of environmental insanitation and epidemics are due to unhealthy living conditions in cramped and congested village *abadis*. One of the biggest advantages which the scheme of Consolidation of Holdings offers is that of home-steading. Instead of living in the village *abadi* with insanitary lanes, the farmer can build a room near his well on his consolidated holdings. The cattle are tied in the fields, and as a result the entire organic matter including urine goes to fertilize the soil.

Spread of infectious diseases and outbreaks of epidemics are also minimised. As the farmers keep busy on their fields, disputes and frictions also become fewer. If law and order is well maintained and the farmers are given licences for fire-arms more liberally, the movement of home-steading which has started will gain momentum ; the old village with its insanitary lanes would disappear, and the countryside will get dotted with home-steads. This in itself will bring a great improvement in agriculture.

Checking of Corruption

As all holdings under the Consolidation of Holdings operations are affected, and landed property worth crores of rupees has to change hands, scope is provided for corruption, which has to be very severely checked. The checks are provided by the frequent visits of the field staff such as Assistant Consolidation Officers and Settlement Officers (Consolidation) to the villages. The stage of valuation of acre-plots known as *killas*, is important, and if *killas* are properly valued, the opportunity for corruption also diminishes. Another stage at which severe check is required is that of re-partition when plots are allotted to the share-holders. Apart from the normal checks, a Flying Squad of experienced Revenue Officers, consisting of four Consolidation Officers of proved integrity headed by an Honorary Public Relations Officer, and a public man, is organised. Whenever a serious complaint is received, whether anonymous or otherwise, it is referred to the Flying Squad, who holds a check on the spot. If the complaint is well founded, the officer concerned is promptly punished. Considering the magnitude of work, a reasonable standard of integrity has been maintained.

Progress of Work

Villages under the Cooperative Act, villages taken up before April 1951, the A Group tehsils taken up after April 1951, B Group tehsils taken up from July 1952 onwards, and the second batch of A group tehsils, are the five categories under which the progress of work upto the end of January, 1955, can be studied.

Progress of work in the villages under the Cooperative Act

All the 185 villages comprising 1,54,402 acres have been consolidated.

Villages taken up before April 1951

Repartition has been done in all the 377 villages comprising 2,82,608 acres.

The first batch of A Group tehsils

Work has been completed in tehsils of Tarn Taran, Batala, Garhshankar, Phillaur, Samrala, Rupar, Moga, Thanesar, Rohtak, Hansi and Gurgaon.

In terms of villages and area, out of 2,549 villages comprising 26,32,659 acres to be completed, repartition has been carried out in 2,525 villages comprising 25,29,150 acres.

B Group tehsils

Work in ten tehsils under this category, namely Nawanshahr, Jagraon, Zira, Jagadhri, Sonepat, Hissar, Ballabgarh, Ambala, Palwal and Kharar was started in the 2nd half of 1952.

Out of a total number of 1,991 villages comprising 22,47,724 acres 1,537 villages forming 15,21,455 acres are in hand. Repartition has been carried out in 928 villages constituting 6,92,398 acres.

The Second batch of A Group tehsils

This category constitutes tehsils of Gurdaspur, Hoshiarpur, Patti, Karnal and Barwala Extension area of Hansi Tehsil. The work was started in the first half of the year 1954-55. Out of a total number of 1,469 villages comprising 11,98,059 acres, 947 villages covering 8,19,805 acres are under operations. Repartition has been carried out in 281 villages comprising 3,06,678 acres. To sum up 4,296 villages comprising 39,62,236 acres have been repartitioned.

Consolidation of holdings has opened new vistas of prosperity for the farmers, and agricultural development has been stimulated on a vast scale. In a year's time from 1st October, 1952, to 30th September, 1953, as many as 1,685 percolation wells were sunk on consolidated holdings. As an example, we may take Samrala tehsil in Ludhiana district. Since the consolidation of holdings operation was completed in 1954, 600 percolation wells have been sunk, 150 more are being dug, and 230 tube-wells and pumping sets have been installed. The Community Projects Scheme has provided large amount of funds for making wells and sinking tube-wells. Roads are being constructed on a large scale, earth work being provided by the villagers under the guidance of Village Level Workers, and areas which had no access by vehicular traffic to towns are being opened up. In fact the rural landscape of the Punjab is changing fast, and instead of haphazardly scattered fields one sees fields with regular boundaries in blocks interspersed with roads. Thus foundation is being laid for large-scale development of the country-side, which is not merely a dream of idealists, but has become a practical possibility.

IV

COMMUNICATIONS

CHAPTER 11

PEOPLE'S ROADS

A vast net-work of roads was developed in India during the British regime. These roads were provided by the Government of the time, and apart from the fact that the people made use of them, they had no organic link with them. The National Government decided that people should be more intimately associated with the road building programme, and priorities for road-building were given to areas in which people were ready to provide land and earth work, while the cost of metalling was to be borne by the Government. This simple decision gave a great impetus to road-building in areas selected under the Community Project Scheme. In Punjab the Consolidation of Holdings Operation which is going on a vast scale in the rural areas provided a unique opportunity for road building. The land could be taken out of the common pool without injuring the interests of individual land-owners. As such, the land-owners readily parted with large areas for the benefit of the community as a whole. They also came forward with their shovels and *kahis* in thousands to work on their roads. These were their own roads in the sense that they had provided land, and had also contributed their labour. Thus they could feel the joy of participating in a common enterprise. For breaking the individualism of the villagers, and for providing an opportunity for community effort, no other programme could rouse so much enthusiasm. Road building was inaugurated in all the Community Project areas with considerable enthusiasm and fan-fare and thousands of men, women and children participated on such occasions. While the digging of earth was going on work-songs were relayed from publicity vans, and the village drummer came with his traditional drum to infuse courage among the workers. The alignment of the roads was given by the engineering staff of the P.W.D. and District Boards. The exact amount of earth work, which was to be done by each family, was worked out well in advance, and assignments were made. Those who on account of infirmity or disability could not participate, gave their contributions in cash.

As a result of this tremendous mass effort 1,000 miles of *kacha* roads have been built. Government provided funds for building culverts wherever necessary.

Programme of work

With the limited resources available it is not possible to provide *pacca* roads everywhere. As such, only such major roads were selected for metalling as afforded the greatest facility to the population of the largest number of villages. The villagers have provided earth work to the tune of Rs. 14,30,000 apart from the value of land which they have contributed free. By the end of June, 1955 about 225 miles of metalled roads would be constructed at an estimated cost of Rs. 52,90,000, and would be maintained by the State Government on the completion of the Projects.

The following road development programme is being implemented in Project Areas.

Nawanshahr A sum of Rs. 8,70,000 has been provided for metalling 29 miles of roads in the Nawanshahr project as below.

		(Rupees)
(*i*)	Banga-Mukandpur road—6·5 miles	1,34,200
(*ii*)	Banga-Garhshankar road—6 miles	1,27,750
(*iii*)	Nawanshahr-Aur-Chakdana road—12·77 miles (Out of 12·77 miles only 7·28 miles from Nawanshahr to Aur at Rs. 1,79,100 will be metalled out of the C.P. funds and the remaining portion from Aur to Lasara costing about Rs. 1,14,850/- under the Bhakra Road Development Scheme)	2,93,950
(*iv*)	Goraya-Barapind road—2·4 miles	68,850
(*v*)	Nagar-Apra road—3·57 miles (In tehsil Phillaur)	1,08,100
(*vi*)	Jassomajra Pharala Mahalpur road—6·11 miles	2,24,440
(*vii*)	Hakimpur-Uppra road—5½ miles	
(*viii*)	Banga-Jadla road—6½ miles	

New roads spring up

Building village approach roads

Sonepat An expenditure of Rs. 10,92,000 has been approved for constructing 42 miles of tarred roads in the Sonepat Project, as detailed below:

		(Rupees)
(*i*)	Sonepat-Purkhas road—8·76 miles	2,54,800
(*ii*)	Kharkhauda-Bhagpat road (Section mile 20 G.T. Road to Jakhauli)—3·15 miles	89,000
(*iii*)	Sonepat-Gohana road (Section mile 7/2 to mile 13-village Badshahpur to village Phinana)——5·76 miles.	1,79,800
(*iv*)	Chilkana-Smalkha road—0·76 miles	25,710
(*v*)	Gannaur-Khubru road—5·5 miles	1,79,200
(*vi*)	A link road from mile 41/1 of Meerut-Sonepat road to Rathdhana—1·46 miles	39,100
(*vii*)	Murthal-Memarpur road—3·6 miles	1,03,200
(*viii*)	Jharot-Narela road (Section Nahra-Nahri)—3·18 miles	1,16,100
	Total:	9,86,910

Jagadhri A sum of Rs. 12,25,000 has been provided for the construction of 35 miles of roads in the Jagadhri project, as detailed below:

		(Rupees)
(*i*)	Yamunanagar-Khajuri road—5·25 miles (For construction of this road, Rs. 1,18,260/- being advanced by the Government of India out of frozen stocks of sugar and Rs. 65,213/- out of Community Project funds).	65,213
(*ii*)	Jagadhri-Bari Pabni road—7·23 miles	2,12,450
(*iii*)	Udhamgarh-Kharwan road—5·15 miles	1,64,200
(*iv*)	Jagadhri-Amadalpur road—3·7 miles	1,20,130
(*v*)	Extension of Yamunanagar-Khajuri road to the boundary of Juthlana village in Tehsil Karnal—0·57 miles	19,450
(*vi*)	Buria-Khadri-Deodhar road	3,21,000
(*vii*)	Chhachhrauli-Darpur road—5·5 miles	

Batala

An expenditure of Rs. 7,30,000 for metalling 35 miles of M.T. and H.T. roads in the Batala Project has been approved. Against the approved expenditure, the following road development programme will be implemented:

		(Rupees)
(*i*)	Batala-Beas road—8 miles	2,17,600
(*ii*)	Batala-Kahnuwan road—5·9 miles	1,17,600
(*iii*)	Aliwal-Fatehgarh Churian road—12 miles	2,95,300
(*iv*)	Bhagowal-Kalanaur road—2·84 miles	59,000

Faridabad

A sum of Rs. 7,00,000 has been provided for constructing 35 miles of *pucca* roads in the Faridabad Project. Against the approved expenditure, it has been decided to metal the following roads to the extent noted against each:

		(Rupees)
(*i*)	Pali-Ballabgarh-Chhainsa-Mohana road—19 miles	4,20,000
(*ii*)	Ballabgarh-Tigaon-Manjhauli road—9 miles	2,62,000
(*iii*)	Pali-Dhauj road—4 miles	7,56,000
	Total:	7,57,600

Nilokheri

An expenditure of Rs. 3,78,000 for constructing 21 miles of *pucca* roads in the Nilokheri Block has been approved. Against the approved expenditure, only 13·85 miles of Nilokheri-Karsa road is being metalled.

Naraingarh

A sum of Rs. 1,10,000 has been provided for the construction of 8 miles of tarred roads in the Naraingarh Block. Against this, it has been decided to construct 13 miles of road from Raipur Rani to Chhaju Majra at an estimated cost of Rs. 3,34,000.

Kulu

Against an approved expenditure of Rs. 85,000 for making 20 miles of new jeepable roads, the following road programme is being implemented in the Kulu Block:

		(Rupees)
(*i*)	Bhontar-Shat road (Section Bhontar-Chhanikhaur)—7 miles	24,000

(*ii*) Kulu-Bhuthi road—4 miles

(*iii*) Katrain-Naggar road—2 miles

(*iv*) Manauli-Jagatsikh road—3 miles

Tarn Taran

A sum of Rs. 95,000 has been approved by the C.P.A. for metalling 6·4 miles of roads in the Tarn Taran Block.

V

EDUCATION

CHAPTER 12

EDUCATION

Success of the development programme depends in large measure on the cooperation secured from the people. This co-operation cannot be of vital dynamic nature unless a new outlook is created for self-help, and the desire and capacity for shouldering responsibility of community work come into being. The only way to create the required initiative and attitude is by providing the right type of education to all age groups. It is known that the existing facilities for educating the people are inadequate, and that the system of education in vogue does not meet the requirements of the Welfare State which is the objective of our planning. Under the development programme efforts are to be made to expand the educational facilities and also to re-organise education in such a way as to make it cater to the economic and social needs of the people. It is sought to expand the existing facilities so as to make these adequate for at least 40 to 50 per cent of the children between the ages of 6 and 14. Social Education Centres have to be developed extensively so that a large proportion of the adult population in development areas receives proper education in citizenship and other vital matters. Another objective of the education programme is to convert the existing schools into Basic Type and to found the new institutions on the Basic System wherever possible. This system has been worked at several places in the country for about a decade now, and has proved to be a distinct improvement on the traditional methods.

The education programme needs for its implementation the right type of personnel, who possess not only sound educational experience and qualifications but are also imbued with real missionary zeal.

The programme has to be broad-based on local enthusiasm and support as far as possible. The existing resources should be properly utilised, and active participation of the people secured for starting new institutions.

Outline of Plan

The broad features of the education programme for development areas have been summarised by the Community Projects Administration, Government of India, as follows:

(i) provision must be made under the normal Plan of Educational Development in each State from the beginning for training a sufficient number of teachers in principles and methods of Basic Education in Basic Training Colleges;

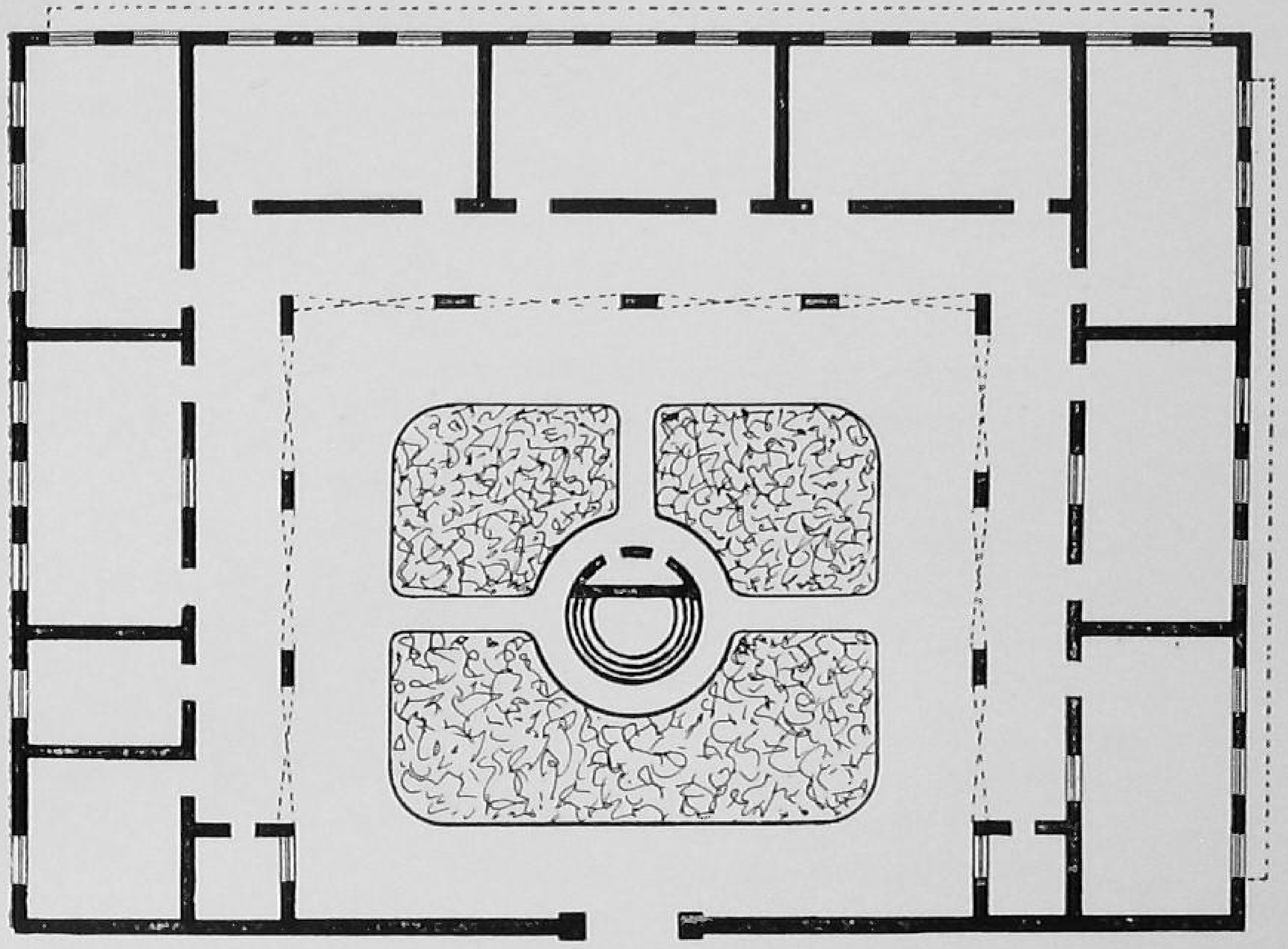
(ii) the existing primary schools should be converted into Basic Schools and in doing so the full cooperation of the local community should be secured. If there are some schools which cannot be converted into Basic type during the period of this plan for financial or administrative reasons,—*i.e.*, either because sufficient funds or sufficient trained teachers are not available—they should at least provide for the introduction of some suitable craft and become "craft-bias" schools, so that later they may be more easily converted into regular Basic Schools;

(iii) a full Basic School should normally consist of 8 classes for children of 6 to 14. In the first instance, however, during these three years, the new school to be established will cover the age-group 6-8 years and those converted will be 5-class schools covering the age-group 6-11 years. It should, however, be understood that as early as possible, all such schools will develop into full fledged Basic Schools with 8 classes;

(iv) where compulsion does not exist during the period of the Plan an attempt should be made to secure the largest possible enrolment with the object of introducing compulsion at the next stage;

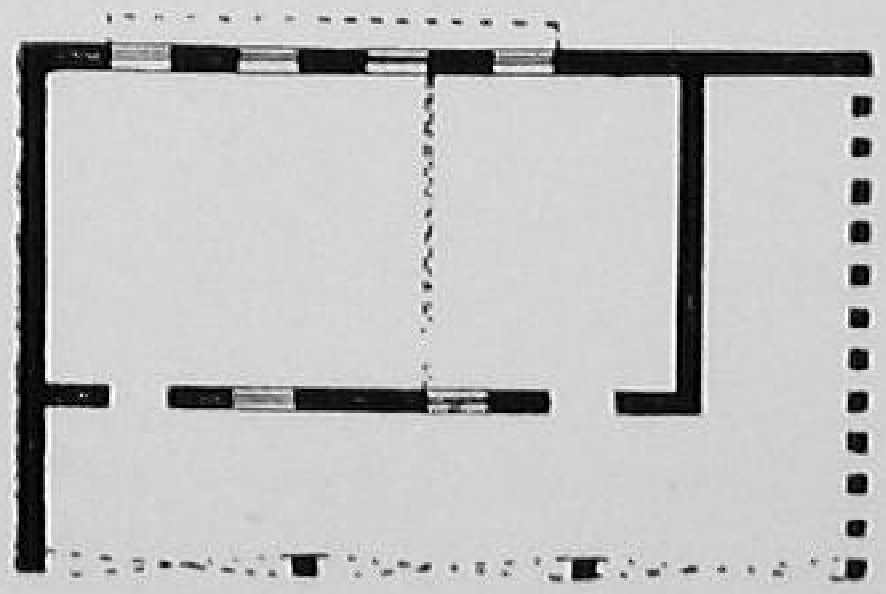
(v) at the Middle School level, the aim should be to develop gradually at least 5 existing Middle Schools into Senior Basic (8 class) Schools. Here also, local co-operation must be obtained and the parents educated to appreciate the value of Basic Education; and

SUGGESTIVE PLANS FOR PRIMARY AND MIDDLE SCHOOLS

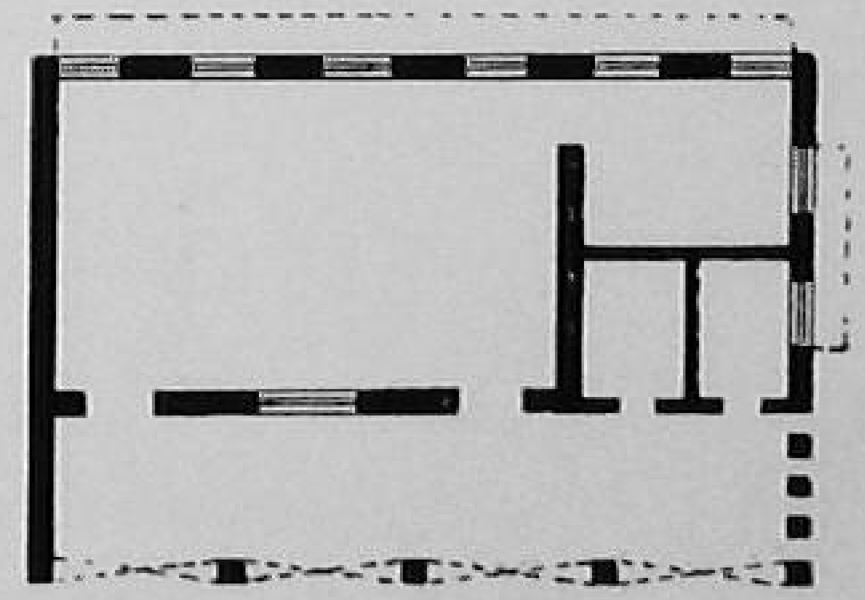


Middle school for about 320 boys

Adequate arrangements should be made for urinals at a distance from the main building



Simple primary school



Primary school with Godown and water room

(*vi*) the High School cannot at this stage be converted into a Post-Basic School, because it is only after children have passed through a full Basic School that they can be admitted to a Post-Basic School. Moreover, the pattern of Post Basic Education is still to be decided. To begin with, therefore, what can and should be done is to provide for the teaching of crafts—specially agriculture in rural areas in such High Schools. States may also plan for a multi-purpose High School with special emphasis on Agriculture wherever possible.

Basic Education

It has been decided to replace the traditional pattern of primary education by basic education, and this is being done through a gradual process. The essential idea underlying basic education is to bring education into closer relation with the daily lives of the people, and to emphasise dignity of work. Basic education aims at producing a race of men who would love self-help and would have as their guiding principle the motto "who does not work, neither shall he eat." In the basic schools the child learns useful crafts and develops sturdy self-respect and poise that come from self-confidence. He is initiated into a meaningful life from the very beginning. Through creative activity he develops efficiency and character, and also imbibes the spirit of co-operation and fair-play which are so necessary for becoming a useful citizen. The present system of education is book-centred; and our educational institutions do nothing but produce a swelling stream of literates who are unemployable outside the narrow field of services. The basic schools by providing training in productive activity help to make the students sufficiently able to stand on their own legs when they have to face life squarely.

The system of basic education has not been perfected as yet. Like all new ideas the concept of basic education needs considerable grooming before it can emerge as a full-blown idea. It is passing through a process of refinement, and the basic schools are the test-fields where new ideas, needed for its proper growth, are slowly crystallizing. It has been found that the primary need is sound teachers. Really good teachers who have full understanding of the requirements of children under the basic education programme are hard to find. Efforts are, therefore, being made to train the trainers

in the new ideology. Another problem to be tackled is that of converting the existing schools into the new type. Unless sufficient provision is made for equipping the old schools with sufficient equipment needed for the system of basic education no success is possible. The replacement of the old system by the new one is thus a thing that can materialise only over a sufficient period of time. The beginning has, however, been made, and the pre-requisites of the new system are being assembled; and the community development programme has as one of its major objectives the reorientation of the present system of education along the lines of basic education.

Adult Literacy

Any drive for educating the adult has to contend against his inertia and set interests. Moreover, the economic diversities of the adults make proper programming of the literacy work very difficult. Again there is the question of finding teachers for the work and of having a suitable place where the literacy centre can be located. The best working hours for the centre are the late evening hours. The community centre or the *panchayat ghar* is generally the most suitable place where the literacy classes can be organised. The Social Education Organizer and the Village Level Worker in cooperation with the village teacher and the local literate men should provide personnel for the centre. The teaching programme should be interesting and suited to the needs of the adult. Side by side with instruction in the three R's, general knowledge about all important matters should be provided. The use of projector and magic lantern would make teaching easier and more interesting. Follow-up literature should be made available in reading rooms and libraries so that the neo-literates can continue to take interest in reading and writing. Other follow-up activities which would promote post-training literary interests should also be devised. An expert educationist has suggested the following ways to overcome the difficulties which generally stand in the way of adult literacy drives:

(1) The workers in the social education field need not necessarily start with literacy drive but must seek and find out adult's natural interests and start with them, as for example, crafts, music, health discussions, cleaning of the village, reading papers or stories etc.

(2) Experiments in literacy methods suitable for adults should be conducted.

(3) Introduction of simple craft work should be so timed as to suit the economic needs of the villager.

(4) Use of the existing school buildings and community centres would to a certain extent help to solve the problem of accommodation.

(5) New ideas and suggestions in teaching methods should be continuously supplied to the teachers to enthuse them.

(6) Books, charts, pictures, films, records etc. should form good media of education.

Targets and Budget Allocations

Targets have been fixed in respect of the major activities under the education programme, and these determine the budget allocations. The targets along with the allocations are as follows:

	Targets	Allocations (lakh rupees)
1. Batala Project		
(*a*) New Primary schools of basic type.	50	3.50
(*b*) Conversion of primary schools into basic type.	14	0.91
(*c*) Conversion of primary schools into middle schools.	2	0.18
(*d*) New middle schools.	5	0.80
Total:		5.39
2. Jagadhri Project		
(*a*) New primary schools of basic type.	40	2.66
(*b*) Conversion of primary schools into basic type.	27	1.53
(*c*) New middle schools.	7	1.05
(*d*) Aid to existing high schools.	2	0.35
Total:		5.59

3. Nawanshahr Project

(*a*)	New Primary schools of basic type.	70	3.22
(*b*)	Conversion of primary schools into basic type.	40	1.00
(*c*)	New middle schools.	6	1.20
(*d*)	Aid to existing high schools.	2	0.20
	Total :	..	5.62

4. Sonepat Project

(*a*)	New primary schools of basic type.	20	1.08
(*b*)	Aid to existing primary schools.	62	0.51
(*c*)	Upgrading of lower middle schools to middle standard.	18	1.18
(*d*)	Upgrading middle schools to high schools.	4	0.69
	Total :	..	3.46

5. Nilokheri Project

(*a*)	New primary schools of basic type.	4	0.15
(*b*)	Conversion of Primary schools into basic type.	9	0.53
(*c*)	Upgrading of primary schools to middle schools.	2	0.32
(*d*)	Aid to existing high schools.	1	1.92
	Total :	..	2.92

6. Faridabad Project

(*a*)	New primary schools of basic type.	10	0.50
(*b*)	Conversion of primary schools into basic type.	27	1.89
(*c*)	Improvement of existing middle schools.	2	0.32
(*d*)	Upgrading of middle schools to high schools.	2	0.20
	Total :	..	2.91

7. Taran Taran Block

(*a*)	New primary schools of basic type.	12	0.60
(*b*)	Aid to existing primary schools.	10	0.03
(*c*)	Conversion of primary schools into basic type.	6	0.20
(*d*)	Upgrading of primary schools to middle schools.	2	0·25

(*e*)	Upgrading of middle schools to high schools.	1	0.25
(*f*)	Aid to existing high schools.	3	0.03
	Total	..	1.36

8. Naraingarh Block

(*a*)	New Primary schools of basic type.	18	0.73
(*b*)	Aid to existing primary schools.	23	0.14
(*c*)	New middle schools.	2	0.41
(*d*)	Aid to existing middle schools.	4	0.12
	Total	..	1.40

9. Thanesar Block

(*a*)	New primary schools of basic type.	10	0.50
(*b*)	Aid to existing primary schools.	10	0.02
(*c*)	Conversion of primary schools into basic type.	7	0.18
(*d*)	Upgrading of primary schools to senior basic schools.	3	0.36
(*e*)	Upgrading of middle schools to high schools.	1	0.15
(*f*)	Aid to existing high schools.	2	0.03
	Total	..	1.24

10. Kulu Block

(*a*)	Aid to existing schools.	20	0.22
(*b*)	New primary schools (with craft bias).	12	0.29
(*c*)	Upgrading of primary schools into middle schools.	2	0.18
(*d*)	Upgrading of middle schools to high schools.	1	0.22
(*e*)	Conversion of primary schools into basic schools.	2	0.14
	Total	..	1.05

In fixing the above targets care has been taken to exploit the existing resources to the full, and to correlate the targets with the needs of the project areas. The budget allocations are based on the anticipated recurring and capital expenditure on each of the above items of the education programme. 25 per cent of the cost of additional buildings required for schools is to be contributed by the villagers.

[illegible]

(ii) [illegible] schools [illegible]

[illegible] existing high schools [illegible]

Total [illegible]

[illegible] Block

(i) New Primary schools [illegible]

(ii) Add to existing primary schools

(iii) New middle schools [illegible]

(iv) Add to existing [illegible]

Total [illegible]

[illegible] Block

(i) New primary schools [illegible]

(ii) Add to existing primary schools

(iii) Upgrading of primary schools into basic [illegible]

(iv) Upgrading of primary schools [illegible] schools

(v) Upgrading of middle schools to high schools

(vi) Add to existing high schools

Total [illegible]

[illegible] Block

(i) [illegible] existing schools

(ii) New primary schools (with [illegible])

(iii) Upgrading of primary schools into middle schools [illegible]

(iv) Upgrading of middle schools to high schools

(v) Conversion of primary schools into basic [illegible]

Total [illegible]

In fixing the above targets care has been taken [illegible] capacity [illegible] the [illegible] resources to the full and to correlate the targets with the [illegible] of the present areas. The budget allocations are based on [illegible] anticipated recurring and capital expenditure on each of the [illegible] of the educational programme. [illegible] per cent of the cost [illegible]

VI
INDUSTRIES

CHAPTER 13

VILLAGE INDUSTRIES AND INDUSTRIAL TRAINING

With the decay of cottage industries the economy of the villages suffered a serious damage, and agriculture alone became the support of the rural masses. While only about 22% of the working population in America works on land and produces more food than is required by the entire nation, in India 70% of the population is engaged in agriculture without being able to supply the food requirements of the country. On account of heavy concentration of population in the agricultural field not only has under-employment assumed serious magnitude but is also indirectly under-mining efficiency and standing in the way of economic development. The ancient crafts and hereditary skill have deteriorated to such an extent that cheap trinkets from the cities are fashionable and in great demand in every village. The need for reviving village industries and crafts is very great ; and no progress is possible unless concerted efforts are made to re-organise the industrial structure of the villages. Revival of village industries would mean not only restoration of their original importance in the rural economy but also modernising them by gradual introduction of scientific techniques and developing markets for their produce.

Cottage industries are industries manned by family units, generally working in their own houses. Small-scale industries are the units which do not have capital investment of more than Rs. 5 lakhs, and do not employ more than 50 workers if power is used, and not more than 100 workers if no power is used.

The types of industries which can be started in villages are many. Judicious selection should be made to suit the needs of each development area. Side by side, efforts should be made to plan their spread in such a way as to avoid un-healthy inter-village competition and lowering of production standards. Location of industries in villages is a subject needing considerable study and research. Haphazard growth and too much artificial stimulation are dangerous things which have to be avoided.

State Assistance

The State has to provide sufficient financial and technical assistance to village industries before these can stand on their own legs. Want of resources and technical knowledge are serious handicaps which the village industries cannot overcome by themselves. There is great need for providing credit to the small producer, who is not entertained by the banks, and has to choose between eking out a miserable living through his own resources or allowing himself to be exploited by the middle man, who acts as his financier, or the unscrupulous moneylender. In the Punjab, the Director of Industries himself sanctions loans against only two personal sureties. No pledging of immovable property as mortgage is required. For loans exceeding Rs. 5,000 decision has to be taken by the Board of Industries which is a statutory board set up under the State Aid to Industries Act.

There are three Boards in the State which watch the interests of village industries. These are :

(1) The Small Scale and Cottage Industries Board.

(2) The State Hand-loom Board.

(3) The State Khadi and Village Industries Board.

The Small Scale and Cottage Industries Board has been reconstituted recently. All the associations of producers are represented on it. Some of the main industries represented are the sewing-machine parts industry of Ludhiana district, the sports industry localized in Jullundur district, the industry producing furnishing fabrics in Panipat tehsil, the hosiery industry of Ludhiana district, cycle parts manufacturing industry of Ludhiana and Jullundur, and textiles industry of Amritsar. This Board will also look after the production of handicrafts and goods of artistic nature. The State Hand-loom Board helps the hand-loom industry. Weaving is one of the major cottage and small scale industries in the rural sector of the State. The State Hand-loom Board watches its interests. The State Khadi and Village Industries Board is being reconstituted now on a statutory basis. This Board caters for the needs of Khadi and other village industries.

A training class at work

Way to economic freedom for women

Learning calico printing in an Industrial School

A Social Education Organiser teaching embroidery to village women

Government of India have recently decided to set up four Technological Institutes in the country, where the problems of marketing, financial assistance and standardisation of goods would be studied, and research conducted. One of these institutes is contemplated to be set up at Faridabad. This institute would serve the whole of the northern region consisting of Punjab, Pepsu, Himachal Pradesh, Delhi, Uttar Pradesh and Rajasthan.

Technological Institutes

The extension of the cooperative methods to the industrial field has yielded highly promising results wherever the experiment has been tried under proper conditions. To give fillip to the organization of industrial cooperatives it has been decided to establish vital liaison between the Industries Department and the Cooperative Department. One of the officers of the Industries Department has been vested with the powers of Deputy Registrar, Cooperative Societies. This officer will energise the work of organization of industrial activity on cooperative basis.

Industrial Cooperatives

The Industries Department maintains an emporium at Simla where representative articles produced in different areas in the State are kept for display and sale. Recently, a section relating to handicrafts and village industries has been organized in the Development Museum, set up at Nilokheri. Nilokheri is an important centre for visitors to the State, and this section of industries will be highly useful in popularising handicrafts of the State. Besides, industrial exhibitions are held at different places where handicrafts and goods of cottage and village industries are exhibited. Government of India have also set up Small Industries Corporation which will make purchases on behalf of Government from small and cottage producers of all such goods as may be required.

Emporia and Marketing

The programme formulated by the Industries Department, Punjab, for the development of village industries is of three-fold character. It provides for:

(*a*) improvement of existing techniques and methods of production through Demonstration Parties;

(*b*) starting of new industries having good potentialities

for development by setting up training-cum-production centres ; and

(*c*) grant of financial assistance for the development of various cottage and village industries.

Industrial Training

Demonstration parties go from village to village and provide instruction and training to local craftsmen and technicians in various industries. These parties have been doing useful work in the State in the past. However, there is a need for extending the scope and range of their operations and of putting them on really sound footing. Such demonstration parties should not only consist of technical experts but also have men who can advise with regard to the organisation and marketing of village industries.

The Industries Department, Punjab, have set up training centres in Community Areas. These centres provide training in crafts given below:

Name of Project	*Crafts in which training is provided*
1. Batala	1. Home crafts for women. 2. Leather-tanning and shoe-making. 3. Soap making. 4. Weaving.
2. Nawanshahr	1. Home crafts for women. 2. Ban-making. 3. Carpets and durree weaving. 4. Leather goods making.
3. Faridabad	1. Home crafts for women. 2. Leather goods making. 3. Leather tanning. 4. Dyeing and calico printing.
4. Sonepat	1. Home crafts for women. 2. Leather goods making. 3. Ban making. 4. Preliminary training in tailoring to women.

5. Jagadhri	1. Home crafts for women.
	2. Brick laying and masonry.
	3. Ban making.
	4. Foot-wear making.
	5. Leather tanning.
6. Naraingarh	1. Home crafts for women.
	2. Ban making.
	3. Leather goods making.
7. Nilokheri	1. Home crafts for women.
	2. Leather tanning.
	3. Foot-wear making.
	4. Soap making.
8. Thanesar	1. Home crafts for women.
	2. Leather goods making.
9. Tarn Taran	1. Home crafts for women.
	2. Soap making.

Our greatest need is to find new cottage and small-scale industries that can be set up in villages and can enrich both the economic and social life of the people. An integrated programme of industrial development in rural areas is, therefore, needed. Efforts are being made to evolve such a programme.

VII
RURAL HOUSING, HEALTH AND SANITATION

CHAPTER 14

RURAL HOUSING SCHEMES

The rural housing scheme which was started in 1950 has provided a solid base for development of village *abadies* in evacuee villages on a planned basis. Funds are now becoming available for building new houses under the Community Development Scheme, and the dream of the framers of the scheme is now taking practical shape.

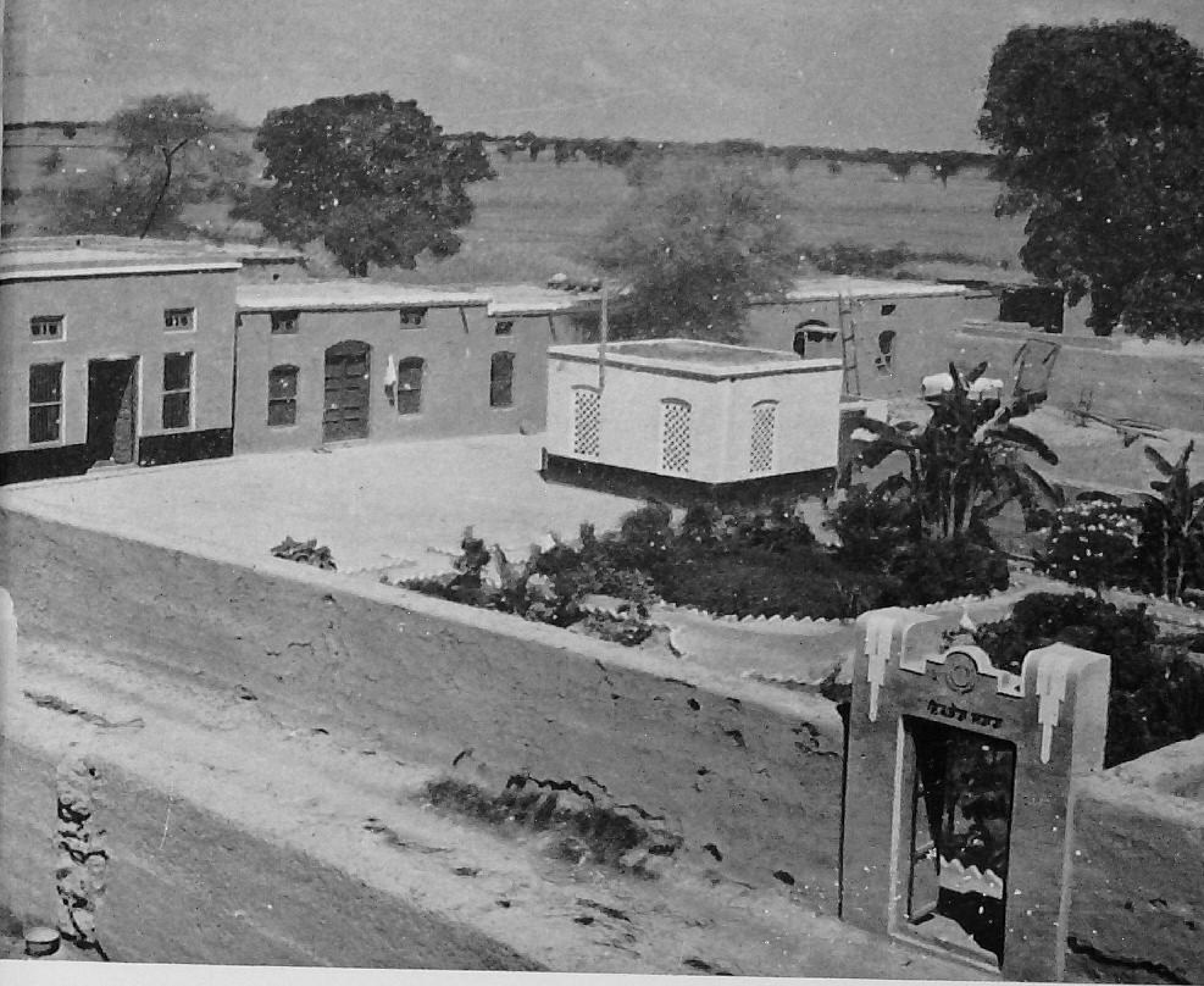
Better villages with broad and sanitary streets and houses provided with windows and ventilators have been the dream and ideal of all enthusiasts whether official or non-official for the last decade. Those who are interested in rural development have realized that the present structure of the villages and utter disregard of elementary rules of sanitation are affecting the health and spirits of the villagers. A healthy and robust rural population with a progressive outlook on life can develop only in sanitary villages. Clean and sanitary villages would have a far-reaching effect on the rural population and their efficiency would also increase. Inspite of the efforts of pioneers like Brayne, Mehta and others, not many model villages have come into existence in India. There is no doubt that slight improvements have been made in some progressive villages such as paving of streets, providing ventilators to the houses and soakage pits near wells, but it was merely tinkering with a problem which required a much greater effort and a more drastic solution. Some enthusiastic idealists who adopted the countryside built model villages here and there *e.g.*, Preet Nagar of Gurbakhsh Singh in Amritsar district in the East Punjab and Sri Niketan of Tagore in West Bengal. These villages, however, have remained islands in the countryside isolated from the surrounding rural area and have not grown into light houses whose light could penetrate the darkness of the countryside. This was partly due to the urban origin of the inhabitants of these colonies who live on a different plane and could not share the life of ordinary rural people and hence these villages failed to be as models in the countryside.

How is it that tangible results have not been obtained inspite of the zeal of village workers ? The explanation lies in the structure of our villages, with houses built back to back and wall against wall, and narrow crooked lanes. The solution really lies in surgery rather than physic ; and extensive demolition was required and building anew in a planned manner. Neither the Government nor the people, however, could ever think of adopting such a drastic remedy.

The partition of the Punjab which resulted in migration of population in both directions provided such an opportunity. The partition shook the countryside like an earthquake, and left death and destruction in its trail. Ruined villages with jagged mud-walls pointing to the pitiless sky, with death-like silence prevailing and casting gloom were a familiar sight in the countryside in 1947. The countryside in East Punjab was littered with several hundred such completely demolished villages, the children of partition. During the migration of populations between the two Punjabs, a large number of houses were destroyed by the evacuating Muslims, who followed a scorched earth policy and used beams, doors, and windows as fuel in their camps. The local people also dismantled many more in the post-partition confusion to obtain building material and fuel. The refugees also, because of uncertainty caused further damage. Rains and floods, of which East Punjab has had a generous measure during the last three years, also took a heavy toll of the *kacha* houses. The result was that there are today some 1,800 evacuee villages in which the number of demolished houses was 90% or more.

Demolished Evacuee Villages

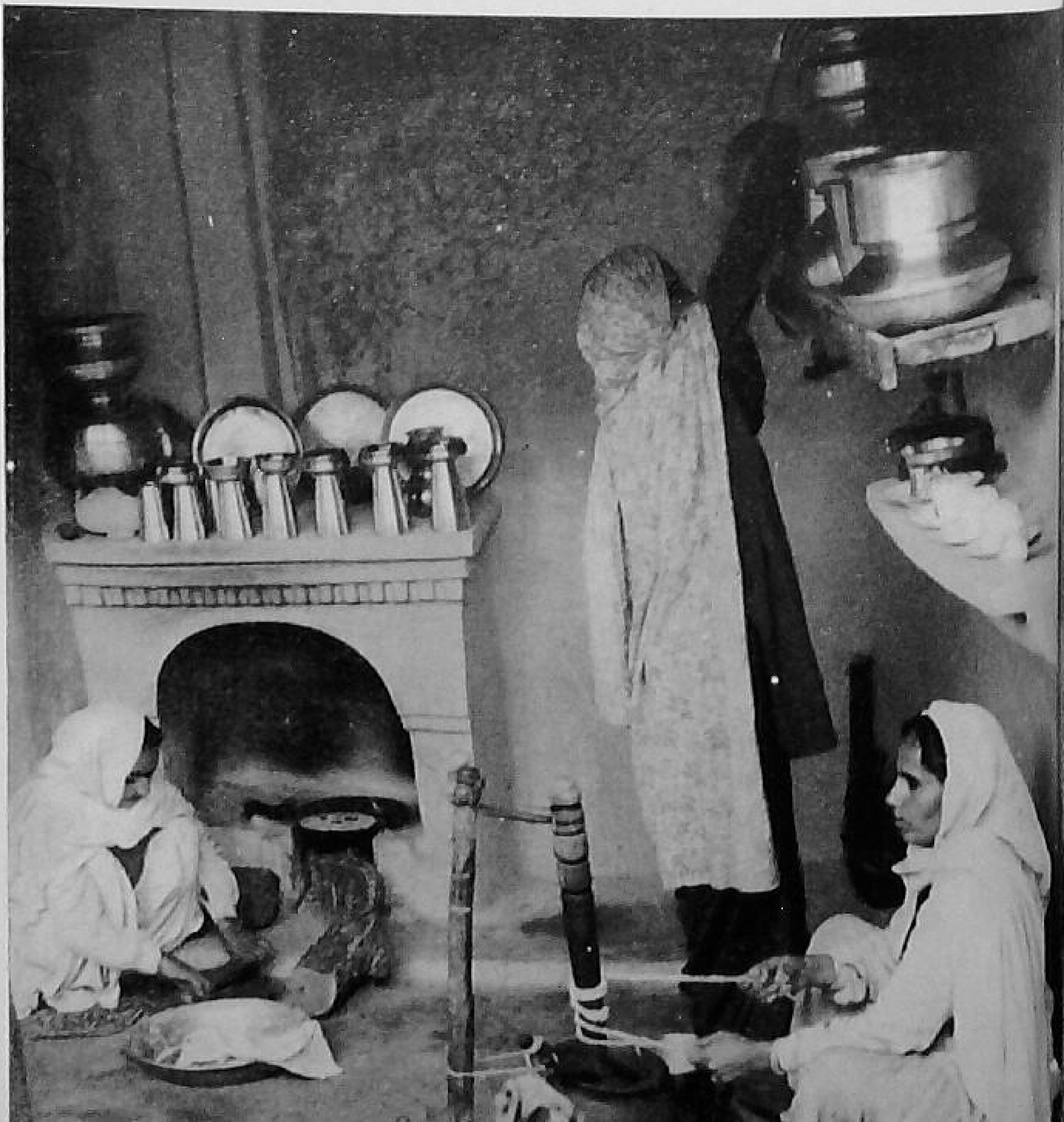
In some respects this was a very depressing situation; but at the same time it was also a great opportunity. While houses are now needed badly for sheltering the allottees of land who have settled in these villages as a result of the quasi-permanent allotment of land, these ruined villages have also provided an opportunity for developing at least one-third of villages in East Punjab on a new basis. The Government of the State has very wisely not wasted this opportunity. It has chalked out a scheme of model villages throughout the State. The Rehabilitation Department in co-operation with the Public Works Department, has gone into action in the countryside. They have demolished and levelled the ruined houses, and have laid out sites for the settlers to build their houses on a planned and organied



Model village Gujjarpur in Nawanshahr Project

A neat and compact Community Centr

Aesthetics of a village house-wife



A neat village kitchen

basis. These plans embody the latest ideas on rural reconstruction, and wide roads are provided so that every house is accessible to bullock-cart traffic.

Type Designs of Lay-outs

Such a large number of villages could not be tackled on an individual basis. Eleven type-designs have been prepared for villages with population ranging from 25 to 100 families, and these are adapted to different village sites. These model lay-outs provide for three standard types of houses, for land allottees, their tenants, and village artisans and agricultural labourers.

Organisation

The Central and the Development Administrations in Buildings and Roads Branch, and the Irrigation Branch of the P.W.D. all jointly provided the field staff required for demarcation and laying out of villages. There are about 40 Sub-Divisions in the Irrigation Branch and a similar number in the two combined Administrations of the Buildings and Roads Branch. 80 Sub-Divisions were thus available to handle this work, and as it was extraneous to their normal duties, it was essential to add to such of the Sub-Divisions handling this work, one Sectional Charge, *i.e.*, one overseer with three Khalasis each. The distribution of work was arranged on the principle that the nearest Sub-Division of a particular Branch was entrusted with the Work falling in its jurisdiction. For instance, villages near about roads were put in charge of the Central Administration of the Buildings and Roads Branch; those near existing canals and distributaries in charge of the Irrigation Branch; while those in proximity of development works in charge of that Administration. Special Sub-Divisions were created in Hoshiarpur and Gurdaspur districts where the number of demolished villages was high.

The Executive Engineer, Designs, of the Buildings and Roads Branch, was entrusted with the task of evolving the type lay-outs plans, in consultation with the Assistant Provincial Town Planner. The field staff consisting of 80 overseers attached to Irrigation Branch and Buildings and Roads Branch worked under the control of the respective Sub-Divisional Officers and their Executive Engineers. The Office of the Assistant Town Planner at Jullundur was attached to the Rehabilitation Department for purposes of collecting and supplying statistics that were needed.

Model Villages

All these model villages cannot obviously be of a strictly uniform design. Factors, like the area and shape of the village site, the situation of large trees and standing *pucca* buildings which are to be retained, the number of settlers etc., will make for diversity in design. But there will be certain common features in all these villages. The most important of these features is a central open space around which the village will be laid out in blocks or rows. This open space will generally be closed by houses and public buildings on all sides thereby securing a sense of intimacy and security in the village community. In the bigger villages houses will be built around quadrangles. As far as possible, a row of plots would contain plots of the same depth and type. Where depth is irregular, different types of houses may be mixed according to the availability of space. There is in all villages provision for community buildings also, such as Panchayat Ghar, places of worship, school, and dispensary. Other necessities of the villagers like the village pond and manure pits, were also not ignored. These will be located on the outskirts of the village. Manure pits will be provided at the rate of two or more per allottee in the fields on the outskirts of *abadi* land so that they are easily accessible. The size of the pits will be 16′ ×6′ ×3′, and there will be a space of 4′ between two rows.

As most of the *abadis* (village sites) are irregular, adjustments between the cultivated land and the area of the *abadi* site will have to be made. If the present site is not sufficient for the allottees and others as well as for provision of special amenities and future expansion, more area can be taken by the consent of the land allottees from *shamilat* land or even from agricultural land, and, if their consent is not forthcoming, by acquisition. Although in a vast majority of villages the existing *abadi* sites are suitable and are to be retained, particularly in the riverain areas where villages are built on high mounds immune from floods, in some villages it is desirable to shift the *abadi* site on considerations of drainage, communications or excessive demolition or clearance work involved.

For land allottees, one kanal or 1/8th of an acre has been regarded as the minimum size for a residential plot. All land allottees, irrespective of the size of their holdings, are entitled to at least one plot. Where sufficient area is available, the size of a plot may

be 2 kanals. The bigger allottees will be entitled to additional accommodation for their tenants and agricultural labourers. The houses will be built after the models provided by the Government, or according to the need and requirements of villages. They have been demarcated in blocks of two, and these blocks have been set back from the streets and paths by 10 feet, and in some cases by 15 feet. This staggered building line is necessary for the achievement of some amount of architectural composition and to break the monotony of a strong and rigid building line.

Community Building

Space for communal facilities would be provided as far as possible on the following basis:

(1) *School.* 1 acre for a small village, and 2 acres for bigger village.

(2) *Village Hall.* 1/2 acres.

(3) *Cooperative Society and Dispensary.* These would be built alongside the rows of shops at the rate of one plot for each of such building.

(4) *Wells.* These would be provided in rectangles or squares.

In villages of more than 100 houses, provision of sites would be made for a rural dispensary, a veterinary dispensary, and a flour mill. Where sufficient number of *chamars* have been settled, and are engaged in leather tanning etc., separate provision would be made for plots for this trade, at some distance from the main village site.

The village would generally be isolated from the main traffic route by a green belt of a width of 100 to 200 feet. Such land if it falls within the village site or *shamilat* land will be left for playground or school.

Streets, Foot-paths, and Cattle-tracks

The streets of the village will admit of vehicular traffic, and may vary from 20 feet to 30 feet in width. The *rastas* or footways will not carry any vehicular traffic but will serve to provide access to fronts of houses. They would be 10 feet wide. Cattle tracks which would primarily serve for access of cattle to the rear of houses would be 16 feet wide.

As far as possible all flourishing trees would be preserved, even though falling within plots. In the proposed layout an attempt would also be made to ensure that no existing *pucca* structures come in the alignment of roads. It would be so adjusted that existing houses fall in one or other of the proposed building sites so that they are left intact.

Wherever the demarcation work involves demolition and clearance of debris to an extent unmanageable by manual labour, use would be made of bull-dozers and graders. In such cases it would also be investigated as to whether it will not be more economical to site the village *abadi* at a new place altogether, and as to whether the allottees of land are agreeable to such a change of site.

Completion Plan

When a village is demarcated on the ground, a completion plan is prepared by the P.W.D., copies of which are kept as permanent record in the tehsil and district revenue offices. This will serve as a check on anti-social elements, who make unauthorised encroachments on open spaces, public roads, and streets. Village Panchayats have authority to punish trespassers on common land, and 'completion plans' as the maps of *abadis* are called, coupled with *Sakni Jamabandis*, will be of great help to them.

In the matter of selection for demarcation as Model Villages, villages on the roads-sides receive a priority because their greater accessibility makes them more useful as models, and more people have an opportunity to see and emulate them.

The houses will be constructed by the allottees at their own cost. The construction of community buildings will also be carried out and paid for by the villagers themselves, through their Co-operative Societies or Panchayats. Government will provide loans and grants to the allottees of land for the building of houses. Loans have been provided at the rate of Rs. 300/- per house in the case of allottees of five standard acres or more, and grants have been provided to smaller allottees either in cash or in kind in the shape of building material. Considering the high building cost, the loans and grants are inadequate, and it is presumed that the resettlers will supplement Government aid from their own resources.

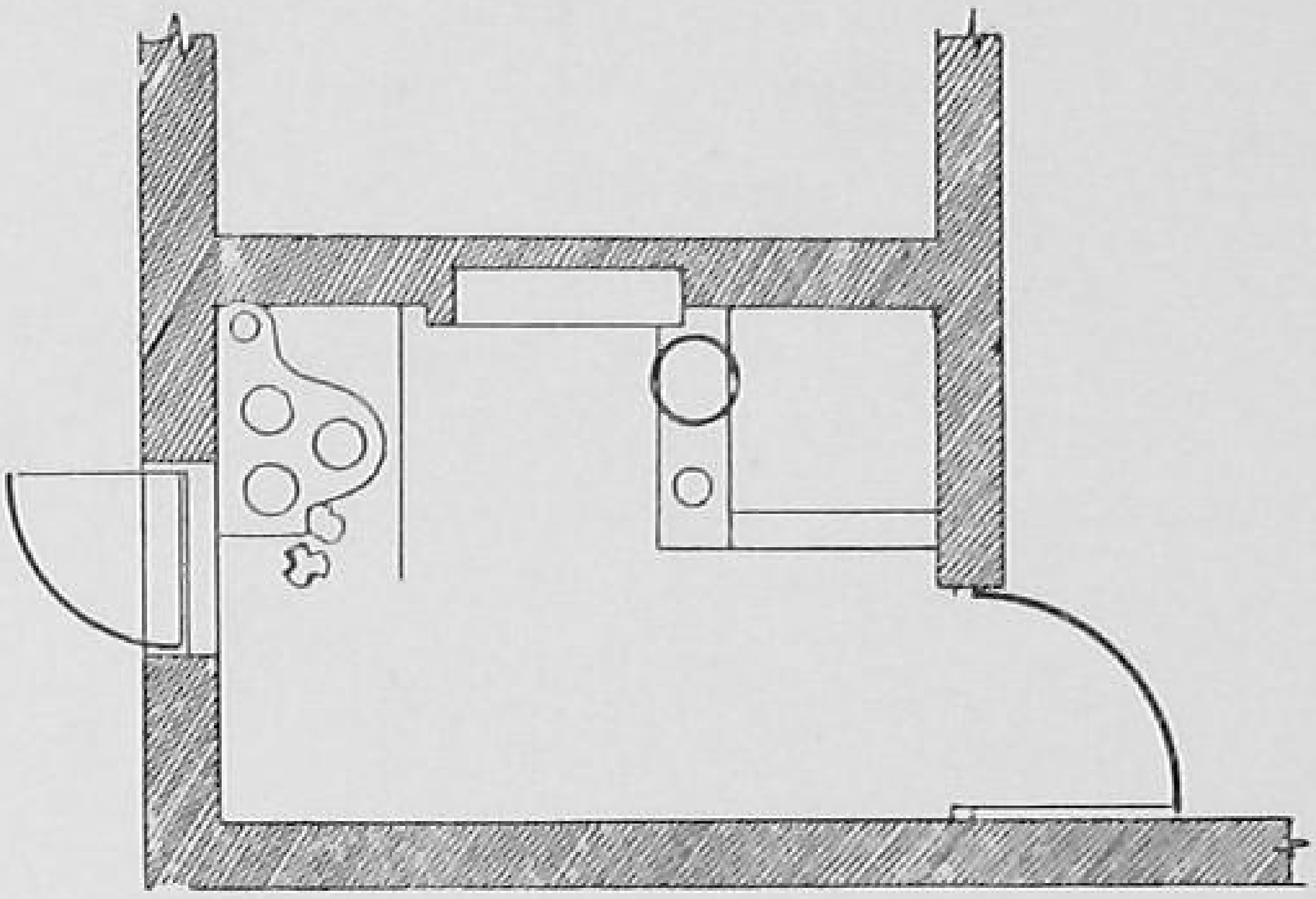
The main objective of the Rural Housing Scheme was to pave way for the allotment of demolished houses and sites in evacuee villages which presented the pattern of a jig-saw-puzzle. A village where 200 families of Muslim evacuees lived, is now inhabited in some cases by 40 to 50 families of displaced persons. This is typical of the villages where the colonists have been settled, as their holdings are larger compared with those of the Muslim evacuees who were owners of small areas. It is, thus, in the case of villages resettled by the colonists that the Rural Housing Scheme has worked to maximum advantage, and has provided scope for allowing larger building space to the resettlers. The Rural Housing Scheme may not have produced Model Villages in the strict sense, but at least it has done away with the evil of narrow and crooked lanes, which are the worst features of an Indian village at present. The results of the scheme may not be visible now, but five years hence when the resettlers would have amassed sufficient surplus, and would be in a position to build *pucca* houses, this scheme will be appreciated. For a village to become model in the true sense, it should have *pucca* drains, brick-paved streets, and also community buildings, like *Panchayatghars*, schools, and hospitals. These new features can be added only if the people as well as the Government gird up their loins. Half the money should be provided by the people in cash, kind or labour, and the remaining half should be provided by the Government. It is only a contributary basis of finance which will stimulate self-help that these villages will become model villages in due course.

CHAPTER 15

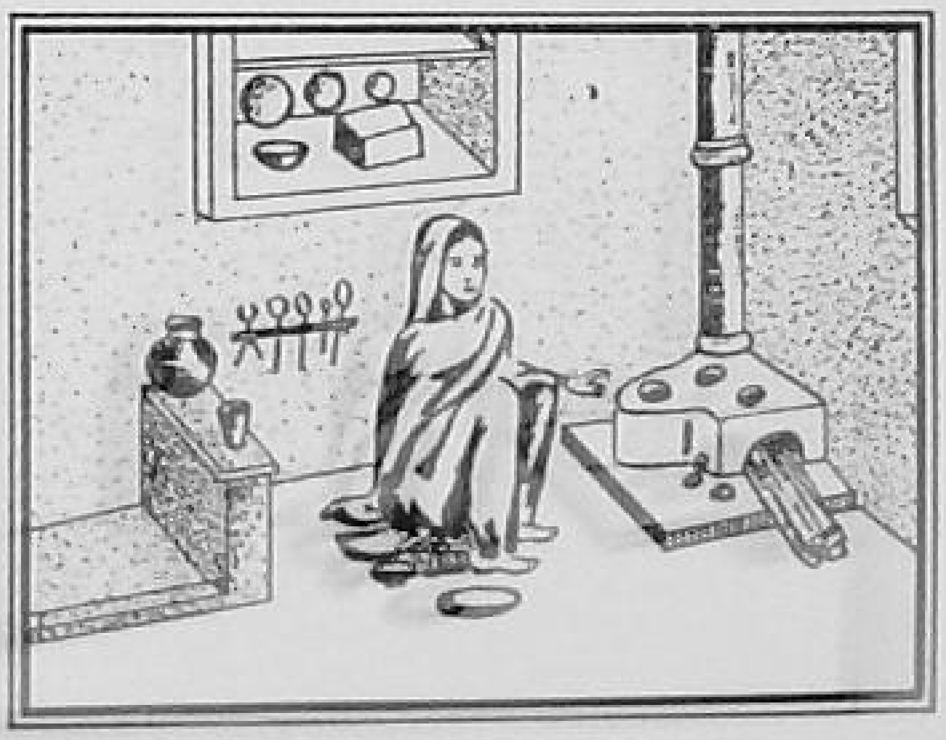
HEALTH SERVICES

In the past rural dispensaries have provided valuable services in the countryside. The number of these dispensaries was, however, inadequate considering the vast population and area. After years of experience it was also found that the Medical Officers in the rural dispensaries could do very little except treat cases of disease brought to them. Most of the out-breaks of diseases are seasonal in nature *e.g.*, malaria, diarrhoea, dysentery, and eye infections. During such outbreaks the dispensaries used to be full of suffering people. The Medical Officers provided temporary relief, and did whatever they could to control the spread of epidemics. Gradually realisation came that the real need in the field of health services was not multiplication of such dispensaries but the creation of multipurpose health centres, disseminating knowledge about disease and making people sanitation-minded besides providing relief. Emphasis was shifted from the curative aspect of health services to the prophylactic aspect. Educative work had to be done at the individual and family levels. The Officer Incharge of these health centres was not merely to be a dispenser of medicines. He had wider responsibilities and a wider sphere of work. He had to be a leader of the community with regard to its health problems. In the words of Professor Henry E. Siegert, he was to work as a "Scientist and Social Worker ready to cooperate in team work in close touch with the people. He disinterestedly serves as friend and leader, he directs all his efforts towards the prevention of disease and becomes a therapist where prevention has broken down, the social physician protecting the people and guiding them to a healthier and happier life." His centre of activity was not the dispensary but the health centre. A health centre is the focus from which the health activities radiate in a rural area. Such a centre includes a dispensary with a consulting room and a small ward for indoor patients. Medical relief, maternity and the child health work, school health, health education, and environmental hygiene are the services provided by the health centre. The officer incharge of the centre, apart from attending to the

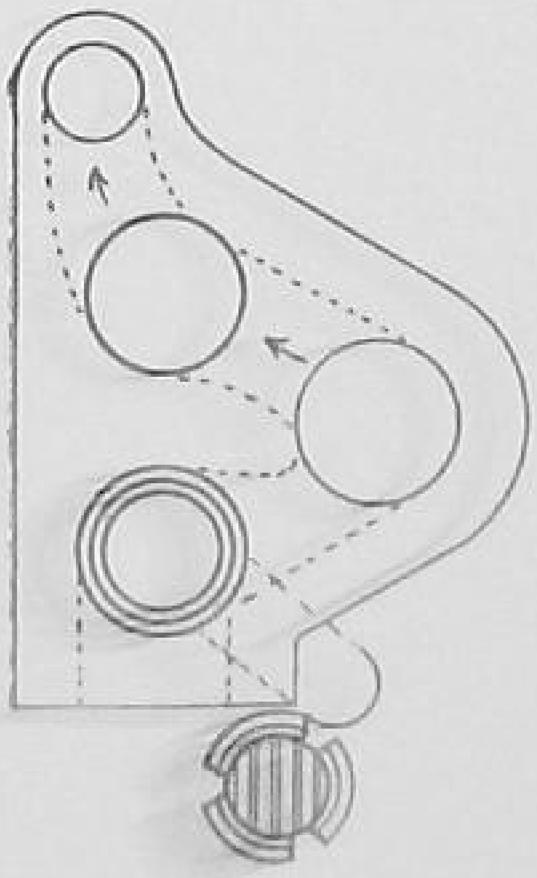
DESIGN FOR A SMOKELESS KITCHEN



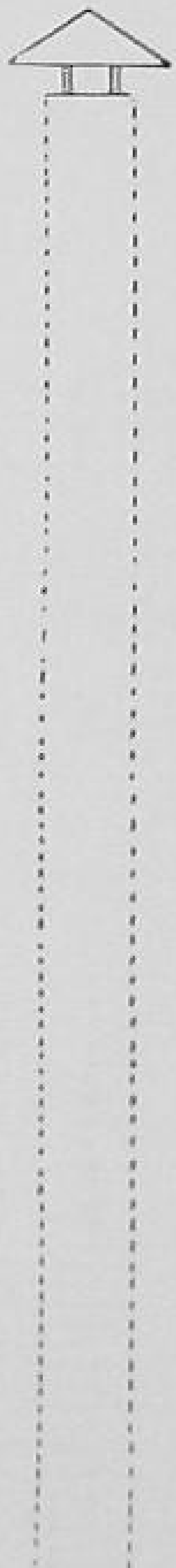
Plan of a kitchen

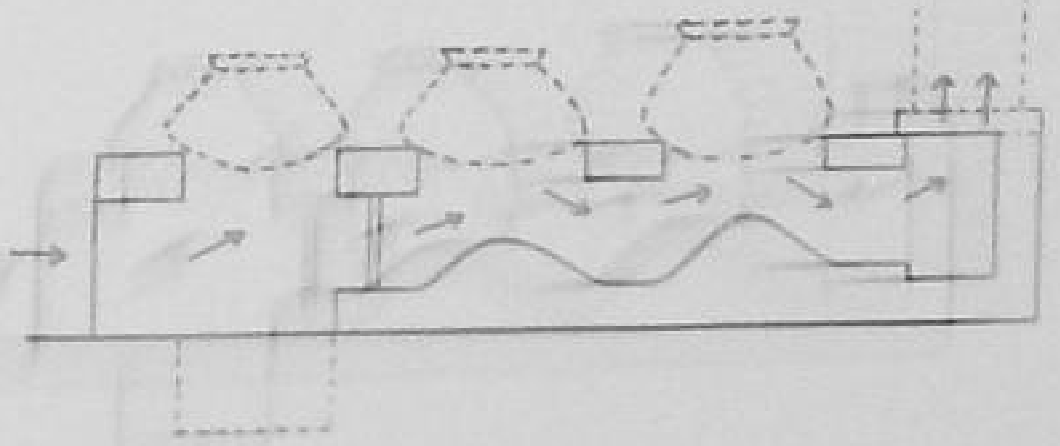


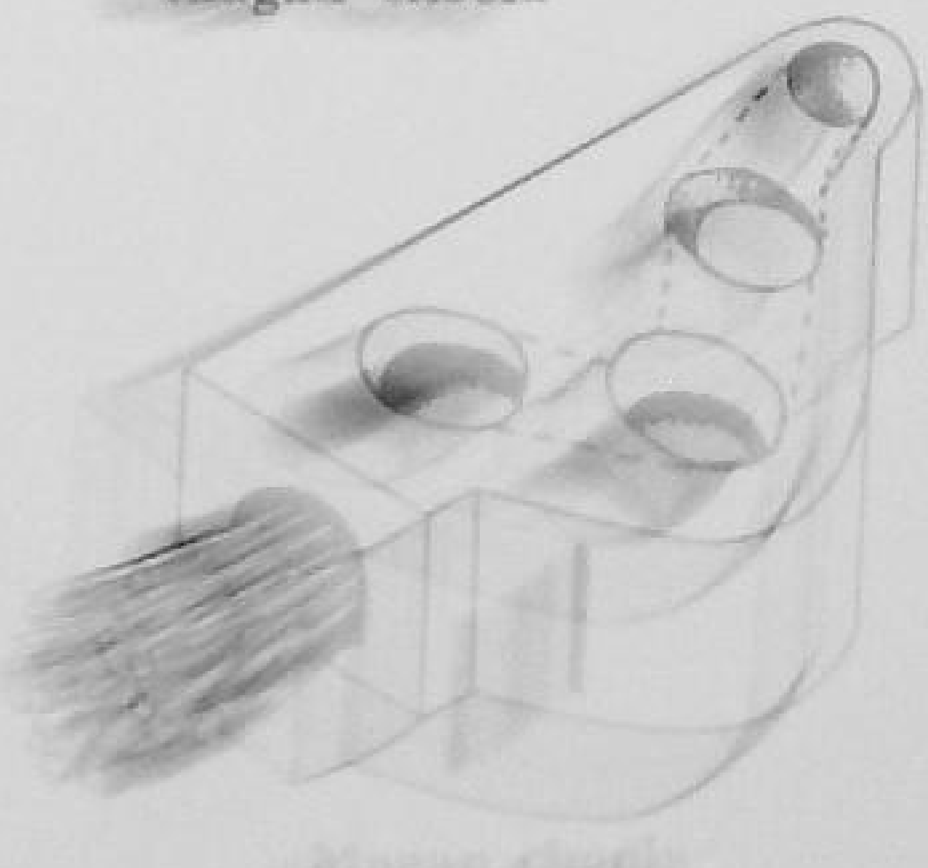
Interior view of a kitchen



Plan of a magan choola







The clay for the choola should not be very plastic. Care should be taken that the seats for the pots are properly made to avoid leakage of smoke. Connection with chimney should also be smoke tight.

Magan choola with clockwise flueduct

dispensary and the ward, visits the villages and provides education and guidance for the maintenance of sanitary conditions and good health. Wherever possible he is given a mobile medical unit that goes from village to village. Wherever a complete centre of this type does not exist the rural dispensaries are being gradually moulded into composite units of this type. In development areas special efforts are being made to convert the ordinary dispensaries into multipurpose units and to open new health centres. In addition to the primary health centres, more fully equipped centres are being created, and these are called secondary health centres. The secondary health centres would be located at the headquarters of development areas. The existing medical facilities would be utilised in the development of such centres.

The secondary health centres will have a medical officer with considerable public health experience, who would be in charge of the health services in each project. He will be assisted by a Public Health Engineer and sanitary inspectors. He will also have a lady health doctor for attending to the health problems of women. The lady doctor would be in charge of maternity and child welfare and would periodically visit health centres and supervise the work of health visitors, mid-wives and Dais.

Maternity and Child Welfare Work

The greatest brunt of mal-nutrition, unhealthy environment, and communicable diseases is borne by the infants, children, and expectant mothers. Mortality among maternity cases is an index of the stage of development of a community.

In the Punjab 3 out of 10 children born die before they reach the first year. Only about 4-5 children out of hundred born ever reach the age of 15 years. About 13 mothers die due to child birth in this country as compared to 1-3 such deaths in advanced countries. As Macdonald says: "The meaning of these figures is that the population spends a major part of its effort in the fruitless production and upbringing of children who do not survive to become economic units, as a result every bread winner has more mouths to feed than is the case in areas where persons in the dependent ages do not make up such high production of population."

The aim of the maternal and child care programme is to check preventible deaths and to build the health of the nation by safeguard-

ing the health of the children. Maternity and child welfare centres are being set up extensively under the development programme. Lady Health Visitors working under the scheme have the following duties:

(*i*) Care of the expectant mother and her requirements from the beginning of pregnancy over the full term;

(*ii*) Care of infants and toddlers upto the age of 5 years;

(*iii*) Education which can help to make the birth a happy and safe event. Besides this, each Lady Health Visitor helps in training the local Dais who receive training.

To these definable duties must be added a host of less formal duties which in one way or the other are relevant to health. A good lady health visitor is very vigilant when she goes out in her area for home visiting. She plans and guides the work in anticipation of trouble, and when any emergency arises she is capable of dealing with it. At one house she may be giving demonstration in cookery and at the other she may be advising as to where to purchase cheap material for the baby's needs. In the words of John D. Kershaw "She is virtually a single-handed 'Citizens' Advice Bureau' with the advantage over that institution of being an actual member of the social service organisation."

Health Education

The health problems of every area must be studied carefully and data collected about diseases peculiar to it. Programmes of health activities should be based on this information. Special emphasis should be laid on propaganda for cleaner living habits. Villagers should be apprised of basic facts about health and prevention of disease, and their fullest cooperation should be sought in maintaining good health and sanitation standards.

Targets

Targets have been fixed for major health activities under the development programme. These are as follows:

Scheme	Targets
1. New hospitals and dispensaries	10
2. First Aid Centres	348
3. Maternity and Child Welfare Centres	57
4. Dai Centres	348
5. Dais to be trained	2,550

The budget provision for the health programme amounts to Rs. 10.59 lakhs for the Community Areas.

The usual village lanes

Paved streets and drains give new look to villages

CHAPTER 16

ENVIRONMENTAL SANITATION

Environmental Sanitation includes the care of the home, the streets, and the village *abadi* in general. Disposal of refuse, drainage, construction of urinals and latrines, and arrangements for portable water supply are all covered under the term 'Environmental Sanitation.' The problems of environmental sanitation are mostly related to construction activity. However, one fact has to be realized that mere construction work with emphasis on brick, cement, and mortar cannot solve the problem of environmental sanitation. It has been described as a way of life which must come from the people themselves. Being a way of life, it must be acceptable to the people who must continue to practise better living habits after the initial phase of enthusiasm and construction is over. This is an important lesson which every leader of the community must bear in mind when advocating improvements in rural sanitation programmes. Even when the improvements have been accepted by a community, there is constant need of apprising its members of the benefit derived from improved environment. To this effect, the work which is being done by the social education organizers in rural areas can be considered as most important. The extent to which social welfare workers are able to make the average villager conscious of his responsibility in the upkeep of paved streets and drains, will ultimately influence the maintenance of the brick work and cleanliness of the area. Another reason which needs equally serious attention relates to the improvement of the health picture of the community after initial success has been achieved in getting the whole village paved, the drains provided, and the wells sanitated. If after a couple of years the villager realizes that diarrhoea and dysentery rate is as high as ever, and fly nuisance has not diminished appreciably, his faith in the approach for solving the health problems will be shaken. It will not be due to inaccurate scientific information which advocates sanitary living for maintaining health, but due to fault either in execution of work for remedying the health problems or inadequate enlightenment of the population about the correct use and maintenance of the improved environments.

Any attempt to force the pace of progress in the improvement of environmental sanitation is dangerous as the results may prove disappointing in the long run. People who are not able to get even two square meals a day will seldom be interested in improving their surroundings. Only those who are well-off will think of a better and healthier life, and even they would like to start only those projects which they consider are their first needs. Hence any work involving improvement of environments must consider the broad basic principles of behaviour sciences so that fulfilment of the task may prove more meaningful to the community. The basic steps which will help any improvement programme are:

(1) The assembling of essential facts which will form the basis of the future programme. It will not be sufficient to collect only scientific data relating to the plan but also the people's views, their information on the particular subject as well as the importance given by the people to the problem at hand.

(2) In planning the programme, the needs of the community and the resources available are taken into consideration, the help likely to be available from the district or the State voluntary agencies is taken into account, and then the final workable plans are drawn in consultation with the technical staff.

(3) The planned programme is put into operation. Having taken the basic principles of human behaviour into account one needs to know the main defects in the environments.

Extent of Damage

Every year thousands of people still die in this country from cholera, typhoid, diarrhoea and dysentery. A great number is invalidated due to intestinal parasitic infections, *e.g.*, amoebic dysentery, hook-worms, round-worms, tape-worms, etc. Plague is still endemic in most areas. All these diseases are a consequence of insanitary environment.

Most of the above-mentioned diseases are a result of polluted water supply, dark and sodden houses, and extensive fly breeding all the year round and more particularly during summer months.

Therefore, the construction work should take care of improvement in the following 4 groups:

(1) Eradication of the fly-breeding areas.

(2) Provision of sanitary wells or *Baolies.*

(3) Proper disposal of kitchen water and the sewage.

(4) Improved air and lighting conditions in village homes.

Eradication of Fly-breeding

Flies breed in filth and heaps of cattle dung which are kept just outside the villages in big dumps for providing manure. The present practice of the villagers in using the fields round the villages for answering the call of nature is unsightly as well as unhygienic. People who are suffering from intestinal infections pollute the soil, and thereby cause infection to anyone who either traverses that area, or eats the raw produce from those fields. Some important diseases which are spread in this way in certain areas of Punjab are hook-worm infection, intestinal parasitic infections, and amoebic dysentery. Even if the stool is not infected, left to itself on the ground it will act as source for extensive fly breeding. Flies are responsible for spreading some of the common ailments, *e.g.*, eye-sores, as well as diseases like diarrhoea, dysentery and cholera. We all know about inconvenience caused to an average rural family during the months of September and October when eye-infections are at their peak, and mothers of infants and children have to walk long distances for treatment of minor ailments in Government rural dispensaries which are always over-worked. As a matter of fact the inconvenience caused due to long distances and waiting keeps many of these mothers away from the dispensaries with the result that severe eye complications occur. It has also been established that fly control leads to a decrease in diarrhoeal diseases, which alone are responsible for a very large number of deaths in this country.

Fly Control by Sanitation

Since flies breed and feed on human waste as well as on garbage, it is essential that measures are undertaken for sanitary disposal of the refuse. If proper disposal of manure is done in the pits, the villagers will doubly benefit from such measures as besides providing relief from fly breeding, it will also help to improve the quality of manure for use in their fields.

Latrines for Rural Area

Bore-hole and trench latrines have been suggested for adoption in the rural area. Bore-hole latrines are not satisfactory in hilly country, or where sub-soil water is high. These latrines are a potential source of contamination where the drinking water is mainly taken from surface wells. Moreover, organic matter, which should go to the fields to fertilise the crops is lost. While solving the problem of environmental sanitation in the rural area, it is the interest of the farmer which is just as important as the health point of view. While the faecal matter should be buried, it should not be lost by burying too deep. A type of latrine which is being popularised in the Kharar Block has been evolved which can be successfully adopted in the rural area. Everclean type of seats are provided which flushed with a *lota* of water remain fairly clean. Faecal matter is led through pipes to pits, which are 6′ deep, 4′ wide and 8′ long. When one pit is filled the other is utilised. This type of latrine can serve 100 people for a period of 6 months.

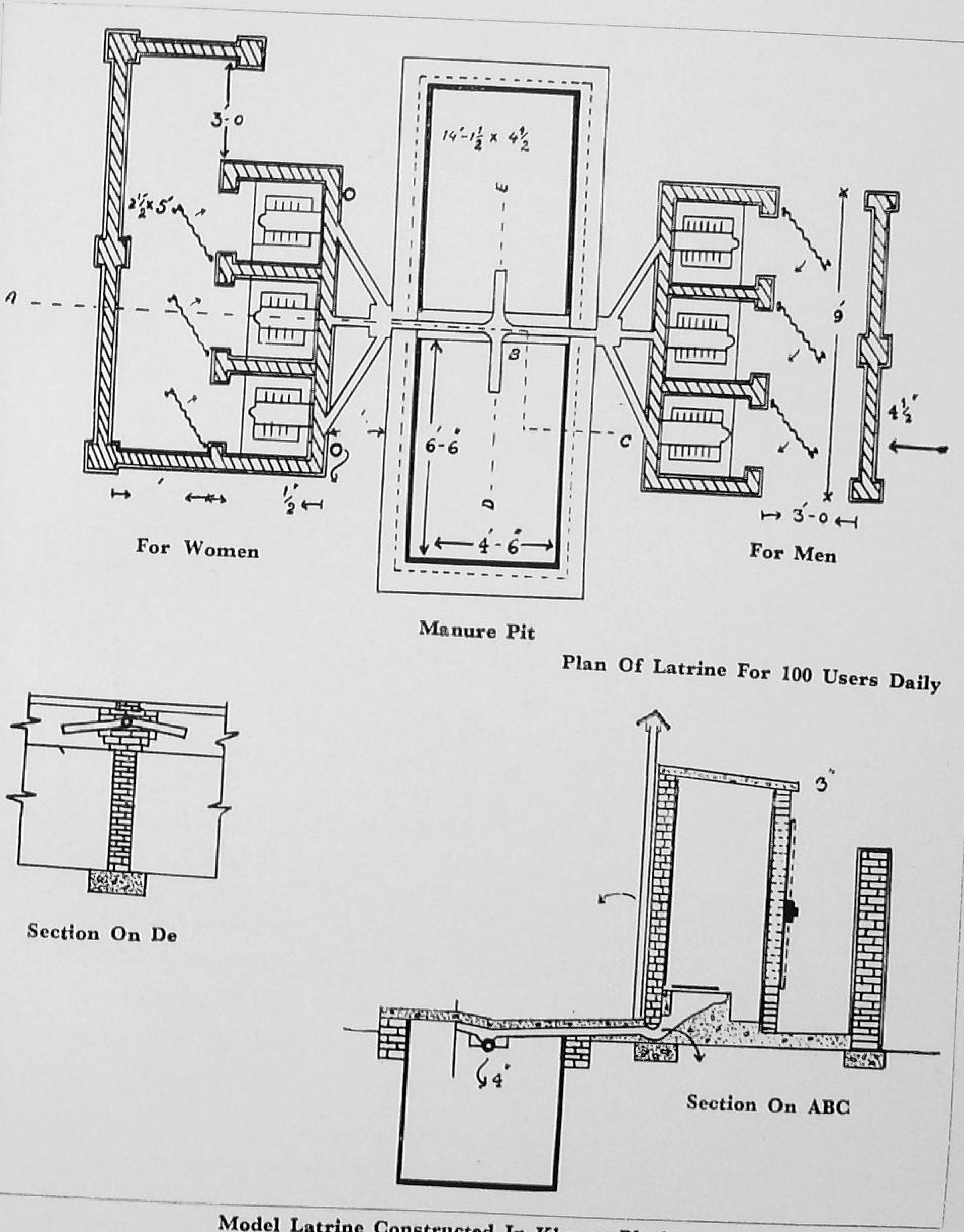
Under the Community Development Programme model latrines are being constructed in all the Projects and Blocks. The target is 418 latrines. Two hundred model latrines had been set up till the end of November, 1954.

Wardha Conservancy System

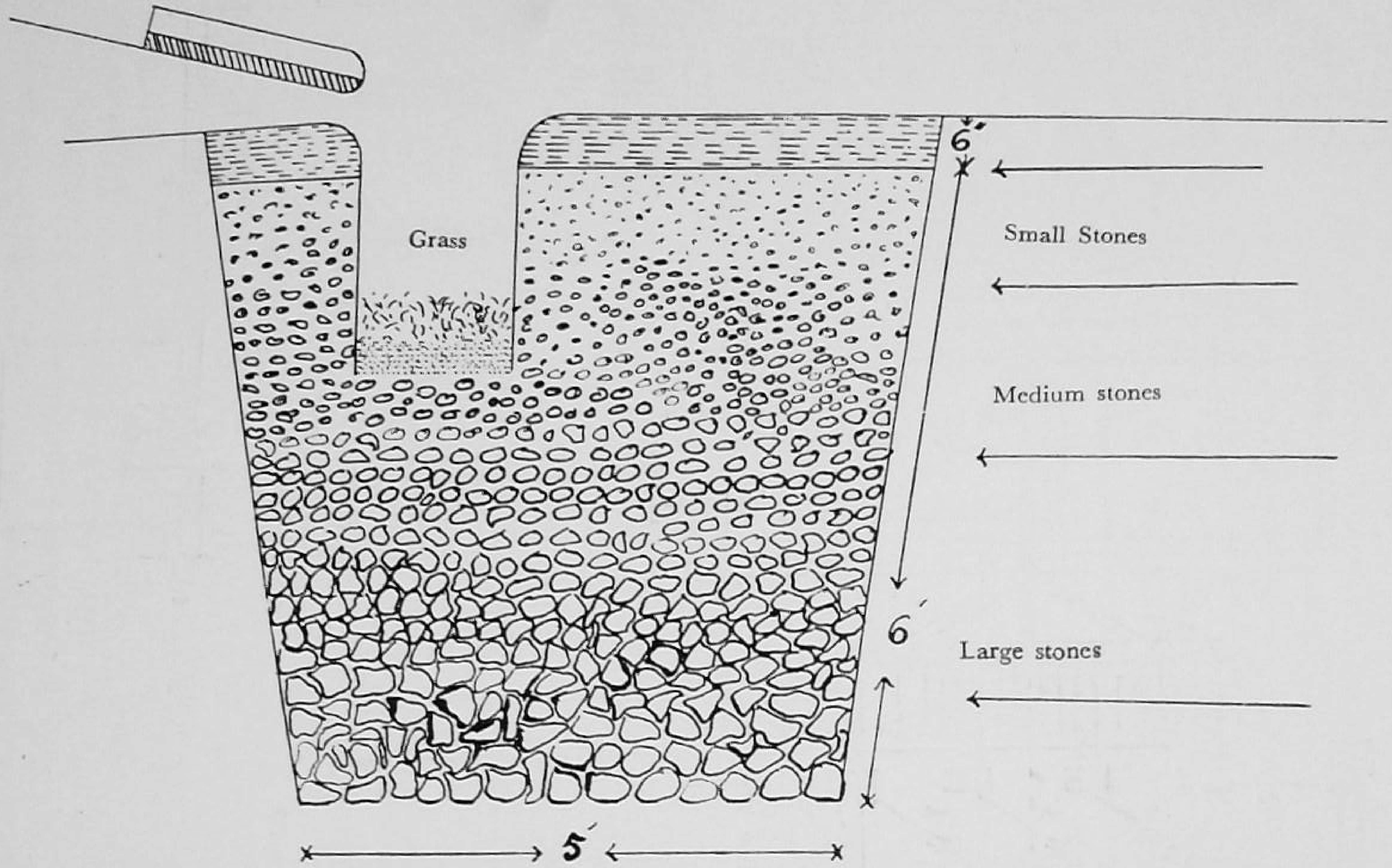
A trench type latrine has been devised and installed in villages around Wardha and the Sewagram Ashram of Mahatma Gandhi. This system has been found to be quite useful in practice and in the Sewagram village itself the income received by the sale of manure from such trench latrines has been found not only to cover the cost of maintenance and supervision but also to leave a balance that can be turned to good account. Practical hints for the preparation of the latrine are as follows:

Dig a trench 25 feet long and 2 feet broad with a depth of 3 ft. Prepare an enclosure with bamboos, tarpaulin, gunny tat or crop waste material etc. measuring about 26 ft. in length, 6 ft. high and 2½ to 3 ft. in breadth with 6 flap doors and 5 intermediate partitions. This enclosure is placed over the trench to provide the necessary privacy.

Some cross planks are placed in each partition to serve as seats. A layer of about 9 to 12 inches of crop wastes, street sweepings, waste



Model Latrine Constructed In Kharar Block



SOAKAGE PIT

fodder etc. are placed at the bottom of the trench. In each partition a basket or an empty kerosene oil tin filled with dry leaves, street sweepings, household refuse wastes or even dry earth is kept. After an individual has used the latrine, he throws a handful or two of the refuse wastes or soil from the basket or tin on the excreta to provide a cover and prevent smell and fly nuisance. Separate latrines are usually provided for men and women on different sides of the village.

The trench type latrine described above is sufficient for the needs of about 100 people over a period of 2 to 3 months. After one trench is completely filled up, the enclosure which is usually made portable with bamboo supports is removed and placed around another trench of similar dimensions. By the time the second trench is also filled up, manure in the first trench is ready for use. In the villages where these latrines are provided the manure prepared is periodically auctioned and the sale proceeds are utilised for the betterment of village conditions.

A human being voids through urine about 12 to 15 grams of nitrogen daily, as against only 2 to 3 grams of nitrogen in night soil.

Utility Urinal

An individual voids on an average about 10 lbs. of nitrogen and 1.6 lbs. of phosphoric acid (P_2O_5) annually in the form of urine. The compounds contained in urine, *viz.*, uric acid, soluble phosphates and potassium salts are in a more readily assimilable form for plants than those present in the night-soil. Unfortunately this important human excretion is greatly neglected and mostly remains un-utilized. In villages and small towns urine is voided indiscriminately at all conceivable places and mostly in the proximity of buildings, village commons or *kacha* drains with the result that its manurial contents are totally lost.

The utility urinal is simple to make. The urinal pout with delivery tube is made of 22-24 gauge galvanised iron sheet, painted inside and outside with white or creozote paint.

In the case of female institutions or institutions where both men and women have to use the urinal, the upright urinal pout may be replaced by a pan seat (like the one we have in the railway train lavatories) which is fitted directly on to the wooden board. The fixing arrangement or the collar joint is also made of 22-24 gauge

galvanized iron sheeting and fixed to the wooden board with 4" long pieces of iron wire. The distribution arrangement consists of 4 galvanized iron tubes, with perforations on the lower side, all of them rivetted at one end to the central plate on which is supported a small enamelled dish which receives the urine.

Installation of the Urinal

Select a 3 ft. × 3 ft. spot in one corner of the office or residence compound or lawn. Loosen the earth on this spot to a depth of 12 to 18 inches and enclose the place on 3 sides with the help of bamboo-sticks and tarpauline, gunny tat or mats etc.

Place the basal portion of the urinal (D above) consisting of a receptacle with 4 distributing tubes, in the centre and on the top of the levelled loosened earth prepared under (1) above.

Place the wooden plank described under (C) above on top of the specified area mentioned under (1) above.

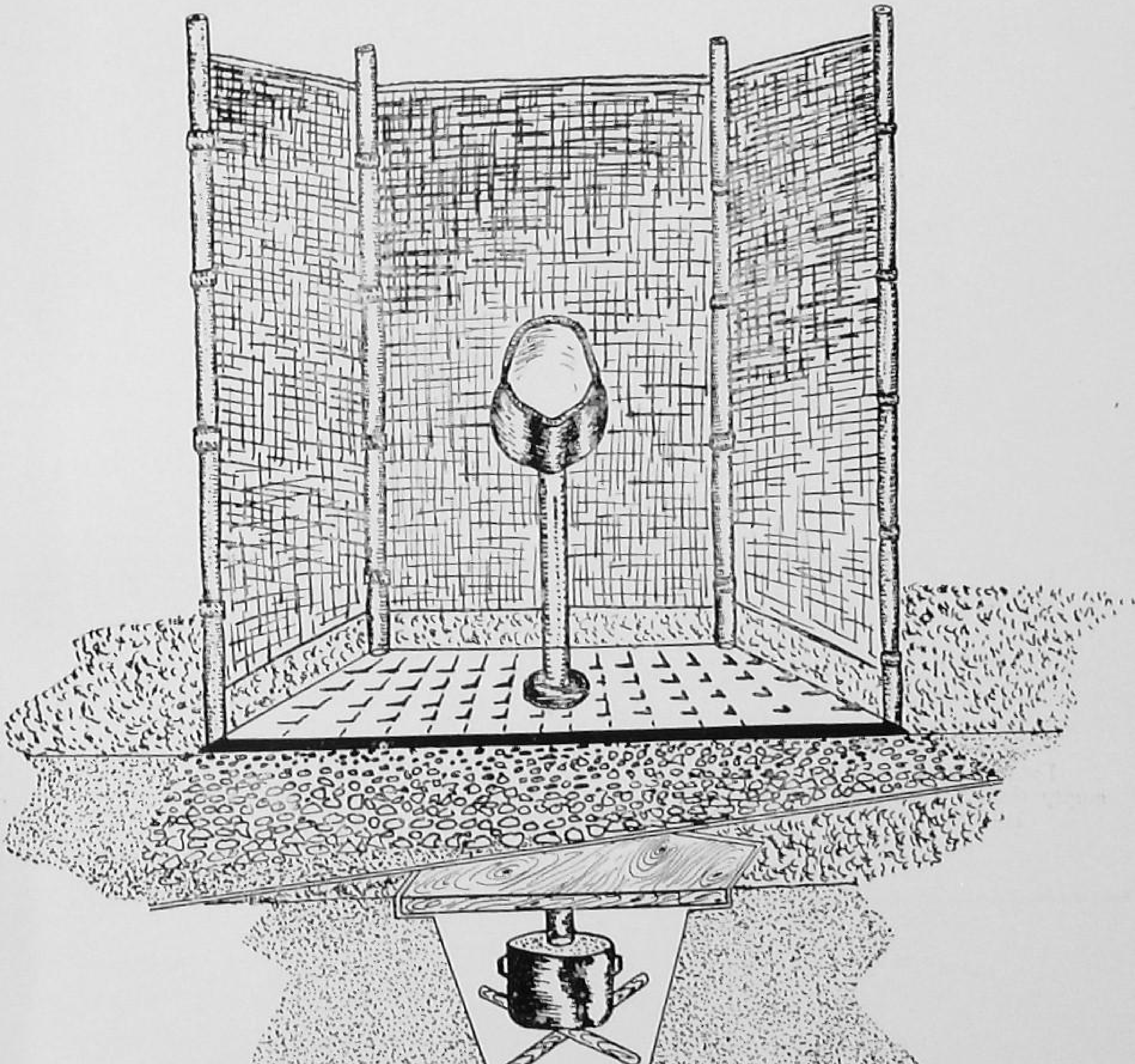
Fix the urinal pout-cum-delivery tube attachment (A above) in the central hole on the wooden board with the help of the collar joint (B) taking care that the end of the delivery tube rests directly above the receptacle (enamelled plate) mentioned under D above.

The urinal is now ready for use.

If properly installed, every discharge of urine in the pout is distributed practically evenly over the whole of the demarcated area of loosened earth, *viz.* 3 ft. × 3 ft., thus ensuring uniform absorption and proper conservation.

Subsequent Care

Experiments have shown that a considerable amount of urine nitrogen (about 50 to 70%) is lost from the urine saturated soil if it is kept in a wet condition and that these losses are considerably reduced if the urine earth is quickly dried in the sun. For deriving the maximum advantage, therefore, it is necessary that the earth wetted with urine should be dried as quickly as possible. In practice, therefore, it is advisable that the wooden plank holding the urinal pout and tube should be raised once every day and the wet urine earth taken out and quickly dried in the sun. For this purpose it would be



Utility Urinal

the soil always remains slightly damp. Hence paving of streets in the wet districts is of imperative necessity. However, in dry districts, like Hissar and Gurgaon, paving of streets is not such an acute necessity and may not be done in preference to other vital needs of the villagers.

Paving of streets is one of the major activities of the Community Projects staff. The provision of voluntary labour has considerably reduced the cost of construction and the advantage of paving can be seen almost immediately the work is over.

Drains provided on both sides are very much better than a central drain with inward slope of the streets. In the construction of drains sharp curves should be avoided as far as possible. Drains with semi-circular cross section are easier to clean as compared to the rectangular ones.

Before starting the construction a sketch of the village plan should be made and plans drawn for construction of the drains. The size will depend on the load the drains will be expected to carry and the plans should be checked by the Overseer. Effluent from the streets may be led out in a storm water channel away from the village or to a sewage farm. Care must always be taken that no vegetables are grown on the sewage farm which are likely to be consumed raw, *e.g.*, onions, carrots, lettuce, etc.

A total length of 12,17,000 ft. of drains and 69,23,800 sq. ft. area of paved streets are fixed as targets to be achieved in Development Areas taken up in 1952-53, and 1953-54. 6,46,000 ft. drains and 44,62,000 sq. ft. area of paved streets were completed by November, 1954.

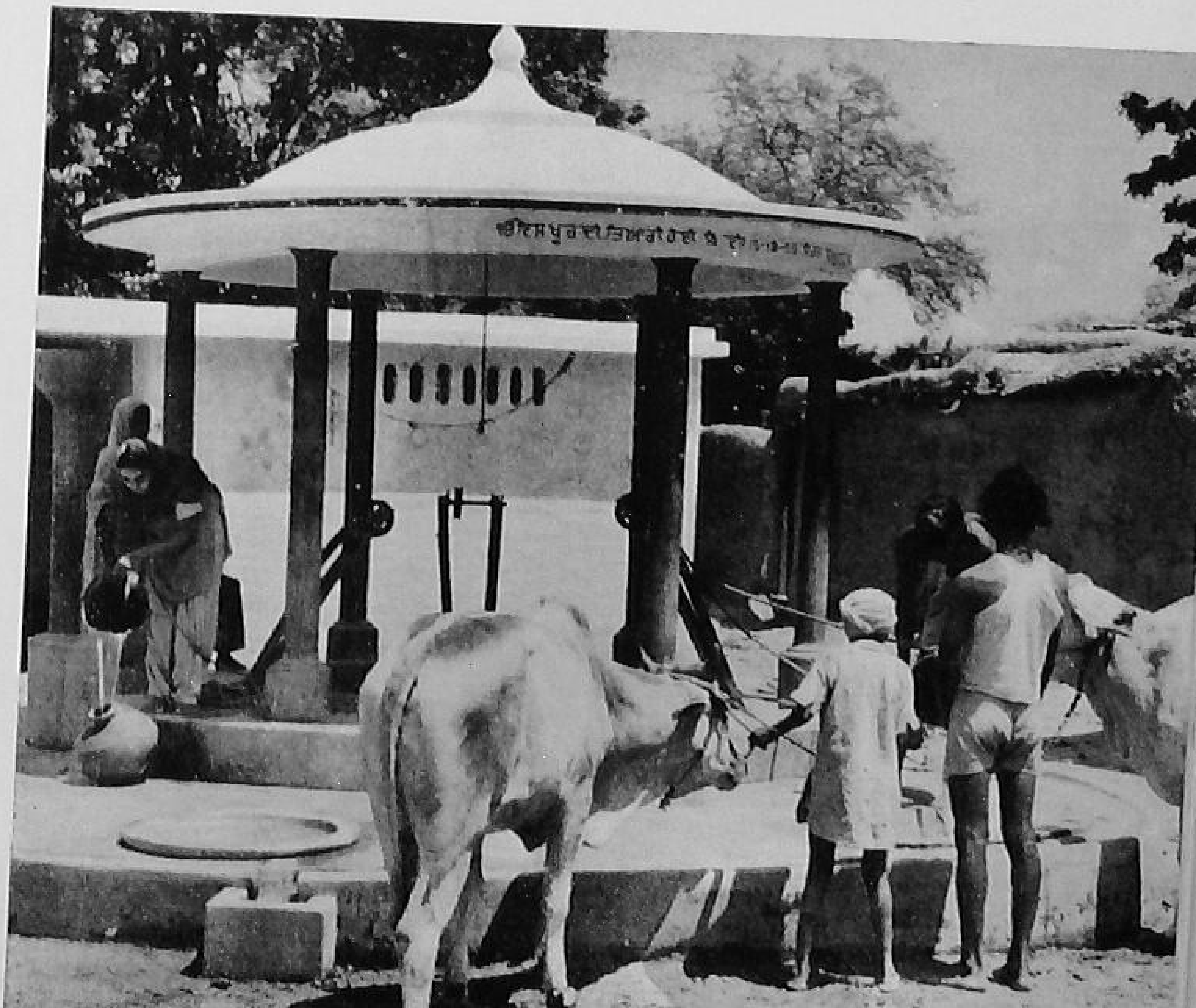
Parapetting of Wells

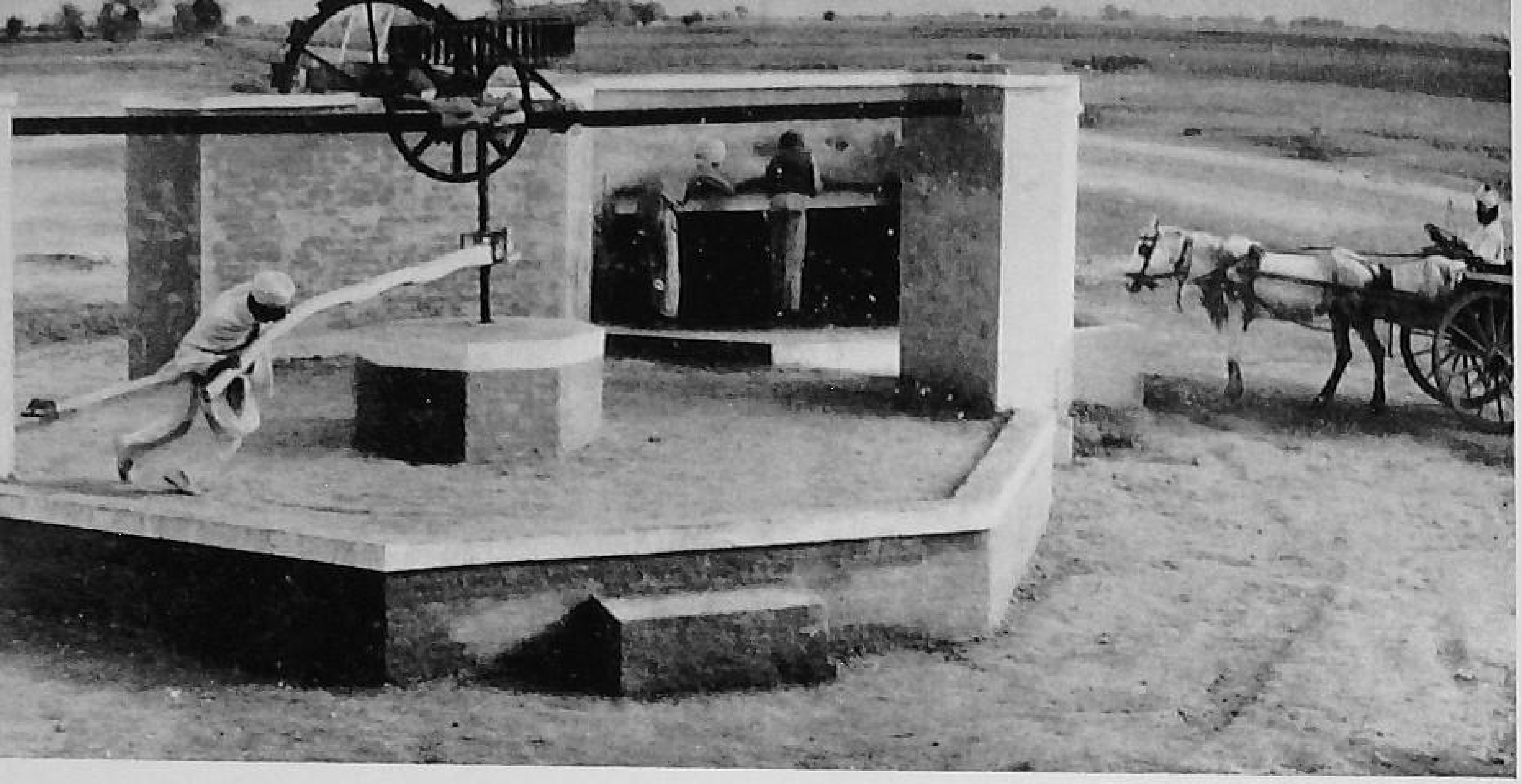
Parapetting of wells with cement has been done on a large scale under the Community Projects Scheme. The well is provided with a sloping parapet and the waste water drains off at sides. In many villages attractive cement roofs have been provided, which greatly improve the appearance of wells and also ensure clean water supply.

The target for remodelling of wells in Development Areas is 3577 against which 1200 wells have already been remodelled.

An old unhygienic well

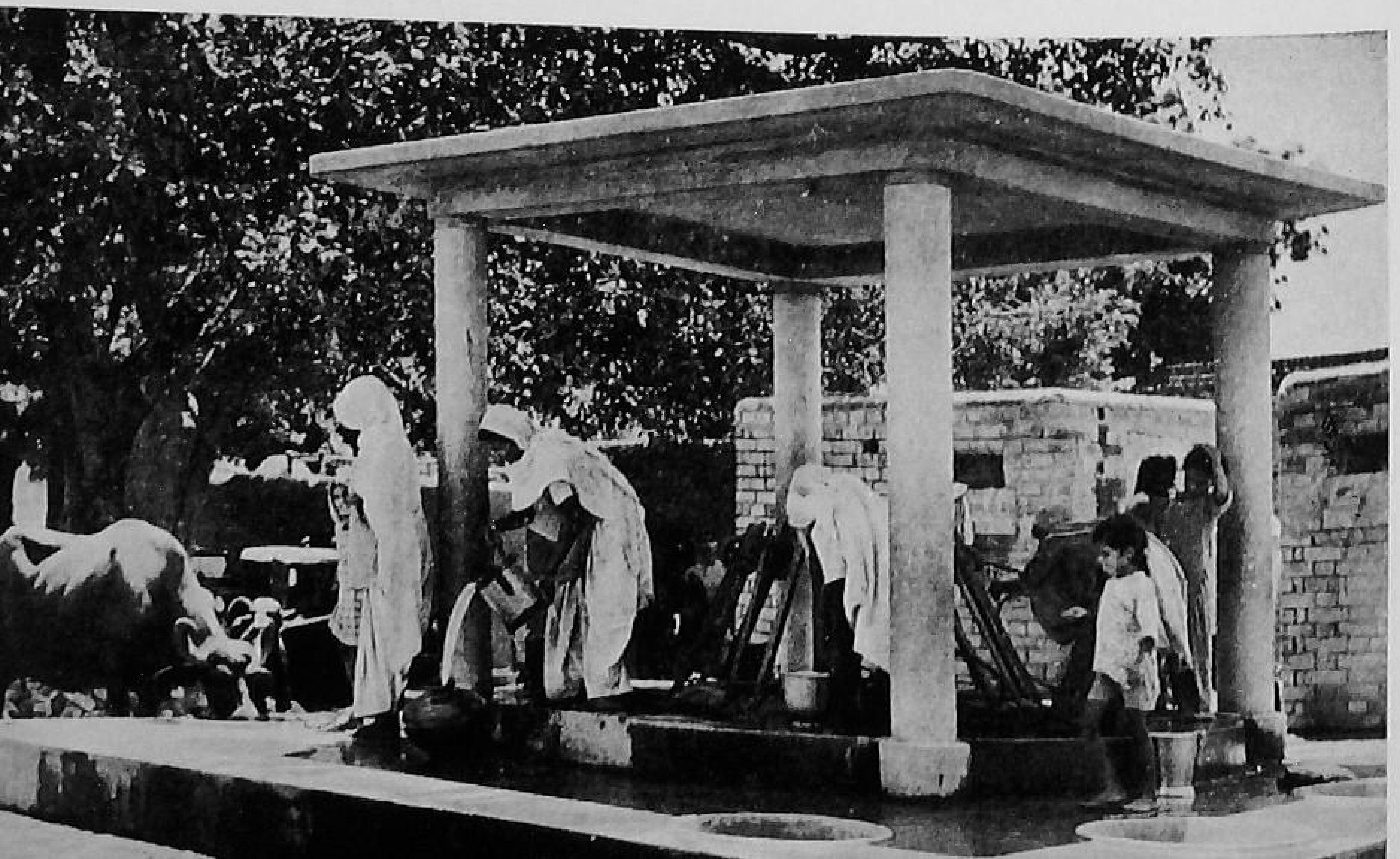
Nicely built new wells are replacing old wells





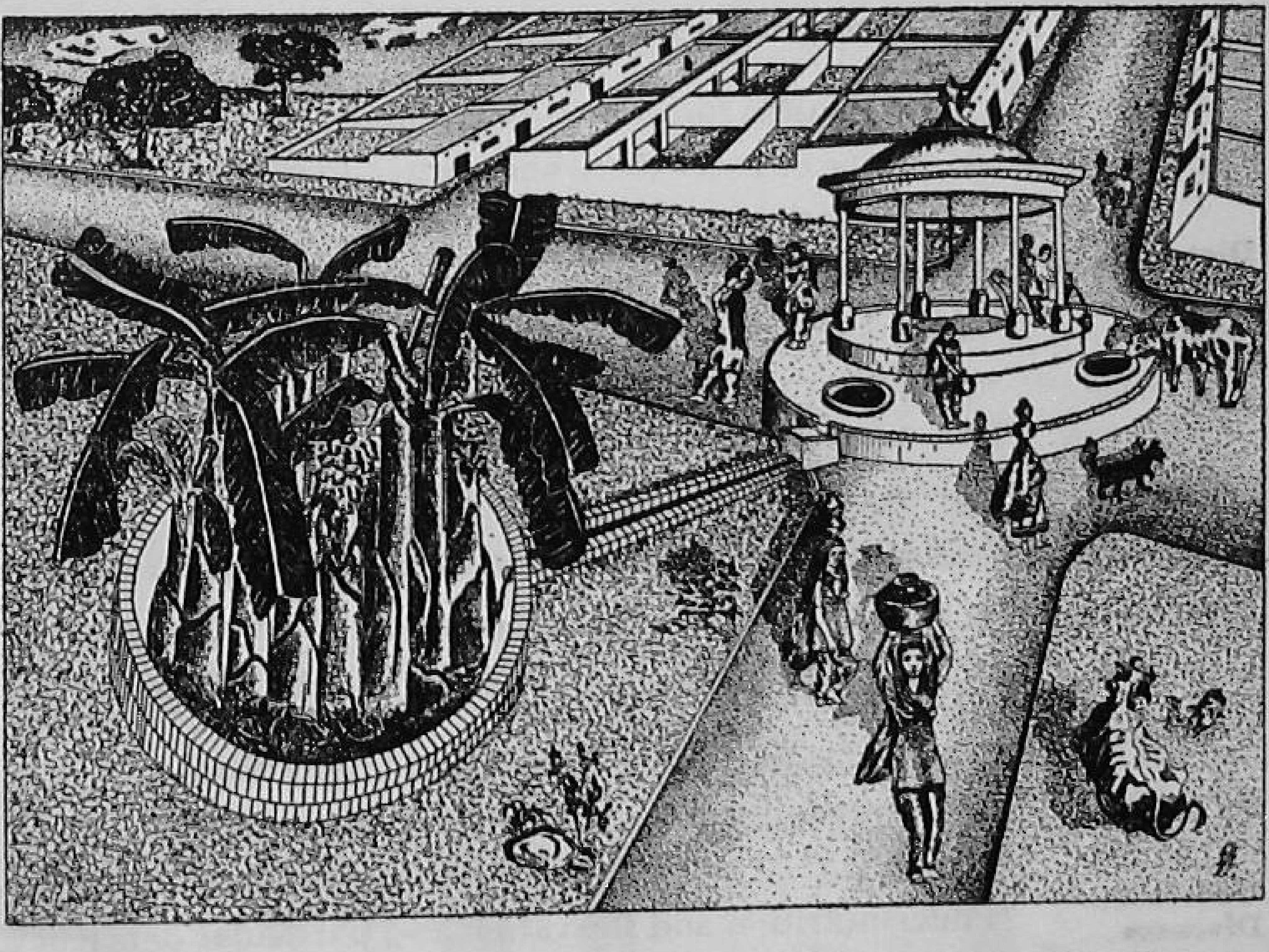
A model well which even a man can work unaided

A simple sanitary well



The problem of disposal of waste water from village wells has not been satisfactorily solved. Soakage pits have been recommended, but it has been found that after some time they fail to soak water. Another solution has been suggested. The drain from the well should lead to a circular enclosure in which plantains may be grown. Plantains have a large leaf surface. As such, their respiration rate is very high, and they very efficiently utilise waste water. Provision of a brick wall for protection of the plants is necessary, as without such protection they are likely to be damaged by cattle.

Plantains for Soaking Waste Water



Banana plantations can absorb all water that usually stagnates

CHAPTER 17

NUTRITION

Balanced diet is essential for good health and proper development of the body. Apart from proteins, starches and sugar, vitamins, which are provided in the form of vegetables and fruits, are just as essential. Meat, fish, eggs, and pulses are the chief sources of protein. Where cereals form the bulk of the diet, the intake of total protein is usually sufficient. Rice diets are usually deficient in calcium. Most Indian diets are deficient in vitamin B Complex, particularly riboflavin. Machine-milled rice is seriously deficient in vitamin B.

Diet of Punjabi Farmer

The diet of the Punjabi farmer, which mainly consists of wheat, vegetables, milk and *lassi*, is on the whole better than that of people of other States in India. However, some deficiencies are marked in particular areas. In the districts of Hariana tract there is very limited use of vegetables, and fruits are seldom eaten. As a result, the intake of vitamin C is very low. Due to deficiency of vitamin B night-blindness is very common in Hissar district, where Bajra is the staple diet. In these areas there is need of greater popularisation of cultivation of fruits and vegetables. Our nutrition policy should be pulled out of the age-long superstitions, and foods like meat, eggs, and fish should be used.

Deficiency Diseases

There are areas in the Punjab where particular foods may not be available, or the soil and water may not have enough of important minerals. A general shortage of food may result in under-nutrition and starvation and particular deficiency of one or other of the important food factors may result in specific deficiency conditions.

Goitre

In the hill areas of the Punjab comprising the districts of Kangra, Hoshiarpur and parts of Ambala, a deficiency condition known as Goitre is common. In these areas the incidence of Goitre is nearly 30%.

Goitre is an enlargement of the thyroid gland in the lower part of the neck. Thyroid gland is concerned with bodily and

mental growth and development. For a proper functioning of this gland, iodine is needed. If iodine is not available in food and water, the thyroid gland gets enlarged and the condition of Goitre is produced. The sub-montane Himalayan region is deficient in iodine and is, therefore, Goitrous. Although the primary deficiency is of iodine, other factors also predispose one to it. A poor diet with little or no fish, vegetables, and milk, insanitary living conditions, hard water, presence of flourine in water, and contaminated drinking water supply, all play their part.

Persons continuously living in Goitrous areas have retarded bodily and mental growth. Their capacity for brain work is limited. Children of goitrous parents may sometimes develop deafness, dumbness, cretinism, or feeble-mindedness. Even the milch animals get affected by the lack of iodine, and the yield of milk is less in quantity and of slightly shorter duration.

Goitre is the result of a simple deficiency, and can be remedied by the administration of iodine in some form. The cheapest and most effective form is the fortified common table salt. In Kangra district, iodized salt has been distributed among villagers as an experimental measure in a small area near Ichhi. As a result of use of iodized salt for 10 years, Goitre incidence has gone down to 1/5th as compared with the nearby areas. Punjab Government have started a Goitre Pilot Project in Kangra district. This Project will study the various factors concerned in the causation of the condition, and also effectiveness of iodised salts. The findings of this Survey Project will be useful in control of goitre in the Punjab, and other similarly affected areas in the country.

Anaemia

The second common deficiency condition seen is Anaemia. Anaemia is the poor condition of the blood. A very important part of the blood is its red blood corpuscles. For good health red blood corpuscles, proteins and iron are needed. If enough proteins and iron are not available in the food, and if there is loss of blood through bleeding, or malaria and hook-worm infections, anaemia appears. The hill areas of Kangra and Hoshiarpur districts not only lack milk and vegetables and fruits, but are also afflicted with malaria and hook-worm. As a result, mild to moderate anaemia is present in about 12% of the population. It is more common among women and children.

Control of hook-worm and malaria infections through individual, community, and State efforts will remove the secondary factor of anaemia. Every household should grow enough vegetables for regular kitchen use. Larger production and use of milk, *lassi,* fish, and poultry will supply the much-needed proteins.

The third common deficiency is that of vitamins of the B-complex group. Advanced deficiency of this vitamin group is seen as pellagra.

Pellagra

Mild to moderate deficiency is marked by lack of appetite, atony of bowels, red and raw tongue, pains, lassitude, and listlessness. These symptoms are fairly common and are seen in urban populations where a greater use of *maida* and polished rice is made, and in the rural areas of Una, Hoshiarpur and Dasuya Tehsils where people live on maize alone for many months. Whole wheat atta, unpolished rice, and a mixed diet contain fair quantities of B-complex vitamin. Fermented bread (*Bhatooras* or *Khamiri roti*), curds, and *lassi* supply good quantities of this vitamin. Liver, pulses, nuts, marmite and food yeast are rich in this vitamin.

A mixed diet containing plenty of fresh green vegetables, milk, curd, *lassi* and whole wheat bread provides all the important food factors in right proportions, and ensures optimum growth, development and maintenance of health.

Mixed Diet

For an adult person, a good diet may consist of:

Wheat, rice & other cereals.	7 chhataks
Pulses.	1½ ,,
Green leafy vegetables.	2 ,,
Root vegetables.	1½ ,,
Other vegetables.	1½ ,,
Fruits.	1 ,,
Eggs.	4 a week
Meat, fish.	1 chhatak
Ghee, oil.	1 ,,
Gur, sugar.	1 ,,
Condiments and spices.	To taste

The best sources of vitamin A are fish, liver oils, whole milk, butter, ghee and green leafy vegetables. Carrots and mangoes contain a good deal of it. Vitamin A is needed for growth and health, and especially for keeping the eyes and skin in good condition.

Vitamins

Vitamin B is needed for growth and health and for preventing the disease called beriberi. Best sources are wheat and rice bran, dried yeast, whole cereal grains and pulses.

Vitamin B2 is also needed for growth and health and for preventing various diseases, including eye diseases and soreness of the lips and mouth. Best sources are dried yeast, milk, liver meat, eggs and fish.

Vitamin C, which prevents scurvy, is found in fresh fruits and vegetables and sprouted grains.

Vitamin D is required by the bones. Rickets and osteomalacia are due to lack of it. It is found in milk, butter, ghee and fish liver oil. It can be manufactured in the skin by the action of sunlight.

Calcium and Iron

The best source of calcium is milk. Green leafy vegetables are also a good source. Calcium is needed for building strong bones and for good growth and health.

Iron is needed to make blood. People suffering from blood destroying diseases, such as malaria and hook-worm, require more iron than healthy people. Whole cereals, pulses, and leafy vegetables are among the foods richest in iron. Iron tablets can supply much more iron than can be obtained from ordinary foods.

Rice, Wheat and Milk

Home-pounded or under-milled rice is better than very highly milled white rice. Parboiled rice is better than raw rice. *Chapaties* and brown bread are better than white bread.

Cereal grains such as rice and wheat do not contain enough of the substances our bodies need. The diet should contain, in addition to cereals, milk, pulses, fruits, and vegetables, especially green leafy vegetables, in sufficient amounts.

It is bad to eat too many sweets and sugary things. They do not supply us with proteins, vitamins and mineral salts, and may spoil the appetite for foods which are of greater value.

Milk is the best of all foods. It supplies all the substances which are lacking in cereal grains.

VIII

AGRICULTURE

CHAPTER 18

IMPROVED CROPS

Provision of irrigation to crops more than doubles the yield. Use of fertilizers and improved seed is also possible only when irrigation facilities are available. Hence, provision of irrigation facilities is of prime importance under the Community Development programme. In areas where percolation wells or tube-wells can be sunk large amounts of loans are provided for the purpose. Loans are also provided for installation of electric motors and pumping sets. For sinking new wells preference should be given to villages in which sub-soil strata are suitable, and other means of irrigation, such as canals are not available. In regard to installation of pumping sets it should be ensured that adequate supply of water is available in the well. For this purpose the well should be bored before the pumping set is installed; otherwise the masonry structure usually gets damaged.

Adoption of Improved Varieties of Crops

It is recognised by everyone that the sowing of improved seed, instead of local mixtures, is one of the cheapest methods for increasing the out-turn per unit area. The yield can be easily increased by about 10 to 20 per cent by the use of improved seed. The farmers are, therefore, persuaded by talks, lectures, demonstrations etc. to sow seeds, evolved and recommended by the Agricultural Department. To make available these seeds, the department maintains a net-work of depots and sub-depots, spread all over the State. At these agencies the seeds are stocked in advance of the sowing seasons, and are sold to growers at low fixed rates. The District Agricultural Officers collect the indents for various seeds for Community Project Areas and Extension Service Blocks in their districts so that the demands of these areas may be met in full. The Project Block Officers intimate their requirements to them by the 15th September for *kharif* seeds, and by the 15 March for *rabi* seeds.

Varieties of Seeds Suited for Cultivation in Plains

Wheat: For timely sowing under irrigated conditions for soils of average fertility, C. 591 wheat is recommended. This variety on account of its good yield, beautiful amber coloured grains, and the premium it fetches in the market, is very popular and covers the largest area in the State.

For rich Soils: C. 518 wheat is the best suited for sowing in rich soils under irrigated conditions. On account of its stiff straw it does not lodge.

For Barani areas: 9 D and C. 217 varieties of wheat are best suited for Barani areas. Thus for Ambala District which is the most important Barani wheat area in the State, these varieties are very suitable.

For humid areas: C. 250 wheat, which is highly resistant to yellow rust, is the approved variety for sowing in humid areas like Gurdaspur District.

For the dry South Eastern Districts: In the districts of Hissar, Rohtak, Gurgaon, and Karnal, summer begins early causing early maturity of wheat. The grains shrivel up soon. Wheat C. 281, by virtue of its early maturing habit is best suited for these districts.

For late sowing under irrigated conditions: The C. 228 variety has proved very good for late sowings under irrigated conditions.

Barley: There are two improved types *viz.*, T4 and T5 which are recommended for cultivation. T4 is more suited for sandy soils and T5 for irrigated lands.

Gram: Type 7 gram is the best for general cultivation.

Rice: The 370 Basmati, 349 Jhona, and 246 Palman Suffaid are recommended for cultivation in the plains.

Sugarcane: Co. 312, Co. 313, Co. 421 and Col. 9, are the standard varieties for general cultivation. Col. 29, as an early maturing crop, and C. 453, as late maturing crop, are also finding favour with the planters.

Cotton American: In the districts of Jullundur, Amritsar, Ludhiana, Ferozepore, and parts of Gurdaspur, 320F variety gives

C591 Wheat

Sowing paddy by Japanese method

A rich rice field

the best performance. The L.S.S. variety is best suited for some parts of Ferozepur District. 216 F is particularly suited for cultivation in the South Eastern districts of Hissar, Rohtak, Gurgaon, and Karnal.

Bajra: A1/3 is recommended for general cultivation in irrigated areas. Bajra T 55 yields the best results in Hissar, Rohtak, and Gurgaon.

Juar: Among the "sweet group" No. 263, and in the "non-sweet group" Juar No. 20, give the best yields.

CHAPTER 19

FERTILIZERS AND MANURES

The plants take their food from the soil. There are several elements which constitute the food of the plant. Of these, nitrogen, phosphoric acid, and potash are the more important constituents. Fertility of the soil depends upon its capacity to supply these nutrients to the plant in sufficient quantities. The continuous raising of crops removes fairly large quantities of nitrogen, phosphoric acid and potash from the soil. In order to maintain the yield, therefore, it is necessary that either the drain on the soil should be reduced by keeping it fallow and following proper rotations, or that plant food should be added to the soil in the form of manure and fertilizers.

Artificial Fertilizers

Artificial fertilizers provide plant food in assimilable form. These fertilizers are of three types:

1. Nitrogenous fertilizers.
2. Phosphatic fertilizers.
3. Potassic fertilizers.

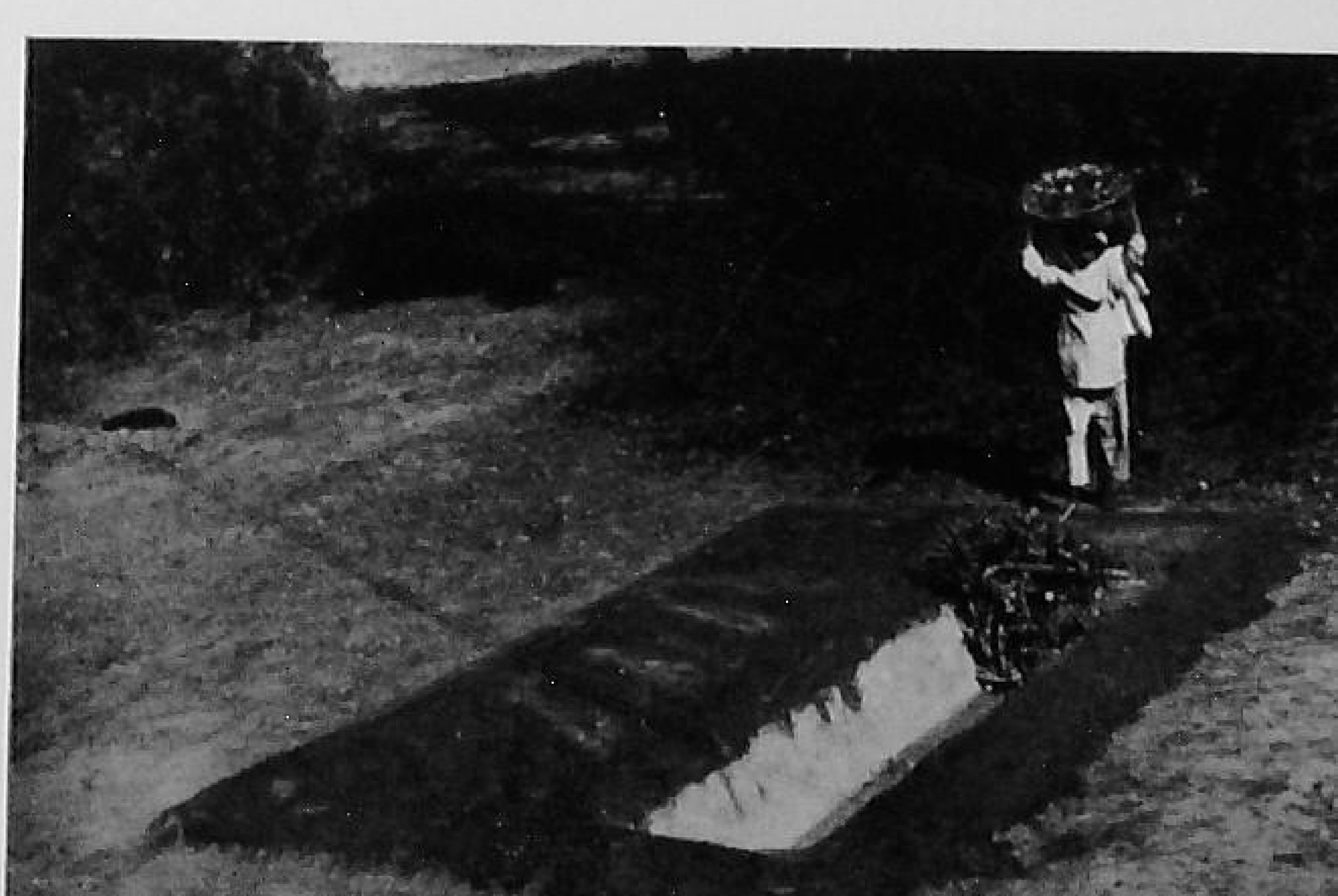
Nitrates of soda, sulphate of ammonia, nitrate of lime and calcium cynamide and urea belong to the nitrogenous group. Superphosphate, basic slag and bone fertilizers represent the second group. Muriate of potash, and sulphate of potash constitute the third group.

The nitrogenous fertilizers stimulate growth of those parts of the plant which are above ground. The *Phosphatic* fertilizer encourages development of grain and promotes early ripening. It also stimulates root development and tones up the texture of the plant, thus making it less susceptible to lodging. It is, therefore, valuable on *barani* lands, and is specially suited for legumes. The potassic fertilizers are closely associated with the production of carbo-hydrates (sugar and starch) in the plant. These are of great importance for crops like potatoes and sugar beet. Among the nitrogenous fertilizers, sulphate of ammonia is more popular, and superphosphate has taken lead among the phosphatic fertilizers.

Preparing straw bed fer cattle

Good manure is ready

Compost pits



From the point of view of manurial requirements, the soils of the Punjab can be divided into two regions. The first region comprises the plains. Here the climate is generally hot and dry, and organic matter in the soil is rapidly oxidised so that there cannot be accumulations of such matter. This type of soil responds to the application of both fertilizers and organic manures. The second region comprises the mountainous and sub-montane areas. Climate here varies from humid to sub-humid and, therefore, the soil is comparatively better supplied with nitrogen and organic matter. It is, however, deficient in phosphorus and, therefore, responds to phosphatic manures. As nitrogen and phosphorus are not available in sufficient quantity in our soils, it has been recommended that mixed fertilizers containing both nitrogen and phosphorus in a balanced proportion should be applied to obtain the best yields. The mixtures recommended for different crops are given on page 154 and 155.

In the case of foodgrains, and potatoes, the fertilizers should ordinarily be applied at the sowing time. These should be placed at a depth of about 4 inches in the case of cereals and at the same level or just below the tubers in the case of potatoes. Nitrogen and phosphatic fertilizers should be mixed together and drilled with a pore and the seed may be dropped by hand in the furrow with the help of another man, where sowing is to be done by manual labour. In the case of sugarcane, ammonium sulphate may be applied in two equal doses. The first dose should be given with the first irrigation in April, and the second dose with the third irrigation in May. It is broadcast after mixing it with wet earth, 3-4 times its weight. It should not be dropped on the leaves of the crop.

Preparation of Compost Manure

It is a well-known fact that all life originates from the soil. Several different types of crops are grown to supply the food, clothing and fodder needs of human beings and animals, and each one of these removes a significant amount of the plant nutrients chiefly nitrogen, phosphates and potash from the soil. Unless, therefore, the loss of these plant nutrients is replenished by the addition of manures and fertilizers stage would come when the soil would become so impoverished that it will be unable to raise any more crops.

The easiest and yet the cheapest way to maintain the fertility of the soil is to put into it in the form of manure all available refuse

of human, animal or farm origin. For the continuity of life and the growth of crops and animals the return to the soil of refuse wastes is most essential.

The average yield of crops in India is much lower than that in other countries. This is apparent from the following comparative statement:

Sl.No.	Name of country.	Average yield per acre			
		Rice lbs.	Wheat lbs.	Cotton lbs.	Sugarcane lbs.
1.	India	800	650	90	28700
2.	U.S.A	1450	850	190	41481
3.	Egypt	2000	1800	450	58240
4.	Italy	3000	1150	—	——
5.	China	1400	980	—	——
6.	Japan	2300	1350	200	——
7.	Java	1350	—	—	98400 to 114800

The main reason for the low yields is, of course, the low fertility of our soils. For increasing crop production, therefore, it is most essential that we should conserve and utilize all available refuse-wastes for manurial purposes.

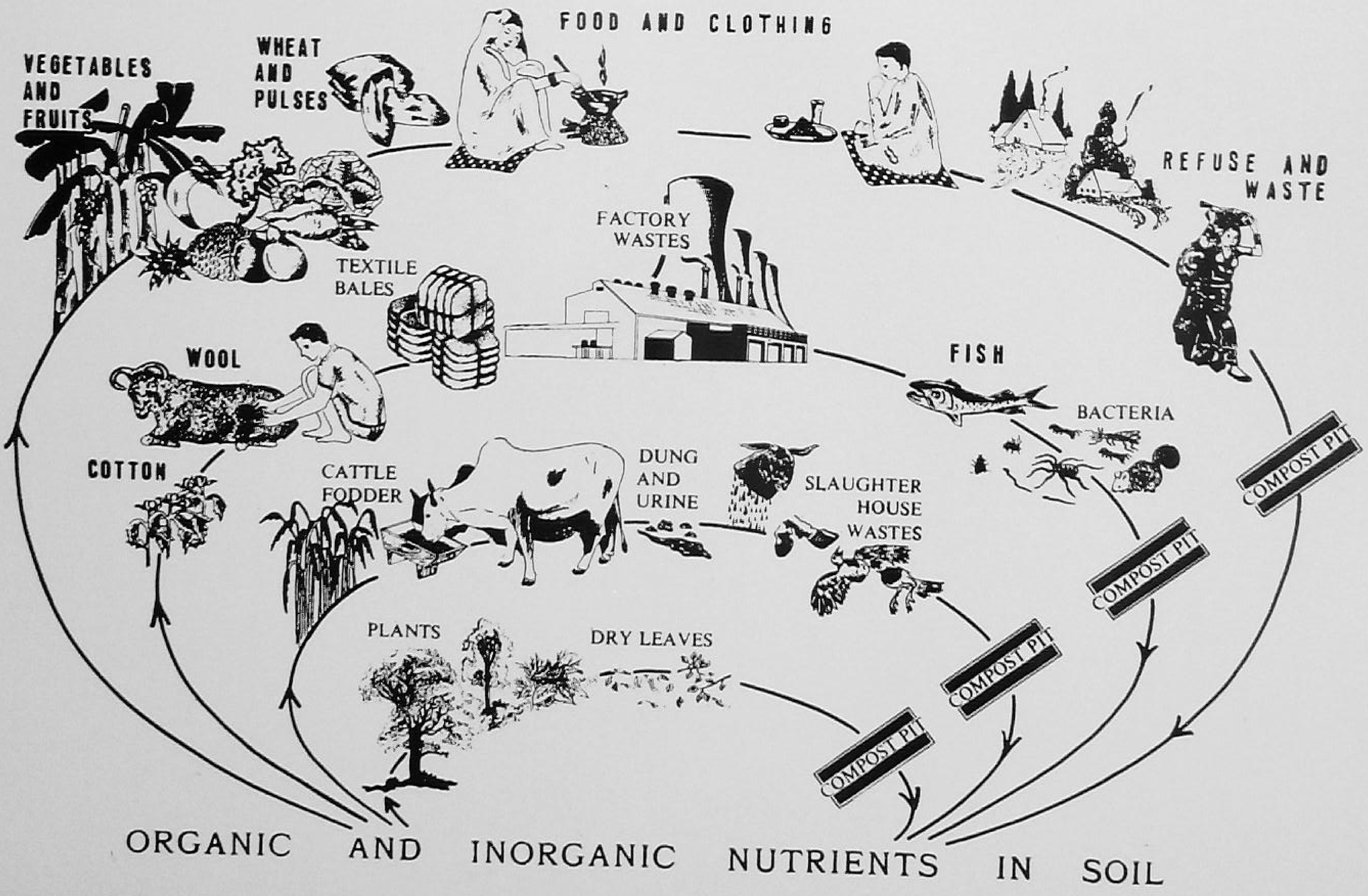
Scope of Increasing Crop production by Utilization of Human Manure and Wastes

According to the 1951 census, the Punjab had a human population of 12,641,205 and cattle population of 6,844,092. The following quantities of waste materials should become available from these two sources:

A—Human Wastes

	Average daily output per head	Average Nitrogen %	Nitrogen voided annually.	Total quantity of Nitrogen contained in human wastes.
			lbs.	
Night soil	150 gms. or 1/3 lb.	1	15,380,000	64,980,000 lbs.
Urine	1 lb.	1	46,140,000	
Dry wastes	1/2 lb.	0·15	3,460,000	

CYCLE OF MATTER



B—Cattle Wastes

	Average daily output in lbs.	Average Nitrogen %	Nitrogen voided annually. lbs.	Total quantity of Nitrogen contained in cattle wastes.
Cowdung	10	0·3	74,940,000	169,860,000 lbs.
Urine	5	0·6	74,940,000	
Fodder Wastes	4	0·2	19,980,000	

On the basis of the above calculations there is therefore, a possibility of producing manure containing about 235 million lbs. of nitrogen annually if all available human and cattle wastes in the State are properly conserved and utilised. If this quantity of manure is utilized in such manner as to supply 40 lbs. nitrogen per acre (the approximate quantity removed by an acre of the wheat crop) it would be sufficient to increase the fertility of about 58,75,000 acres of land. Considering that the Punjab (I) has a total cultivated area of 14,135,969 acres, the above mentioned quantity of manure would be sufficient for application to about 40% of the total cultivated area every year. Since organic manures have a considerable residual effect and are, therefore, usually applied only once in two or three years, our requirements for maintaining the fertility level of our soils can be met practically wholly by the proper utilization of waste products of human and cattle origin. A further increase in production can be effected by supplementing organic manures by artificial fertilizers. During the post-partition period of about 7 years, intensive cultivation with the application of organic composts and artificial fertilizers has greatly increased the crop production with the result that our State has now become not only self-sufficient but a surplus one.

Poor Use of Organic Manure: Its Reasons

Farm yard manure or compost manure which is prepared by the proper decomposition of refuse wastes is a complete manure, because it contains all the plant nutrients in varying proportions. Unfortunately, however, very little care is taken to conserve this manure; and the following factors are responsible for the neglect:

(1) A major portion of the cow-dung in villages is utilized for preparing cowdung cakes for fuel.

(2) Cattle urine, which is a very rich source of nitrogen, is entirely neglected.

(3) Collection of refuse wastes is not done thoroughly and little, if any, effort is made to utilise household wastes and street sweepings for purposes of manure production.

(4) The refuse wastes that are collected are usually heaped up in an indiscriminate manner with the result that a major portion of the plant nutrients is washed away by leaching with rains or by volatilization on account of excessive exposure to the sun and air.

Heavy losses of the organic matter take place under the above conditions particularly when the manure heap is allowed to remain unused for a period of six to nine months. This results in the production of a very poor quality of manure containing hardly 0·3 to 0.4 per cent of nitrogen.

The following recommendations are made for conserving and better utilization of farm yard manure:

Hints for Improving Farmyard Manure

(1) Refrain from burning cow-dung cakes. The practice of converting dung into dung cakes for fuel purposes is extremely wasteful because this results in a total loss of the organic matter and other valuable plant nutrients. Farmers should meet their fuel needs by setting apart a small area of land for raising fuel wood trees, such as Kikar, Mulberry, Shisham etc.

(2) Conserve cattle urine. Cattle urine is a very rich source of nitrogen. It contains 1 to 1.5 per cent nitrogen as against only 0.2 to 0.3 per cent contained in the cowdung. Urine can easily be conserved by using crop wastes or even dry soil as a bedding under the cattle. The soaked material is removed every morning and put into the manure pit.

(3) Utilize all human and household wastes for manure preparation. Night soil and urine are very rich source of plant nutrients but little if any, care is taken to conserve and utilize these for manurial purposes. It is suggested that trench type latrines on the model of the "Wardha

Latrine" should be installed in the villages and that all inhabitants should be encouraged to use these. The cost of constructing and maintaining these latrines is very little and the amount of manure made available from this source more than compensates for the little trouble of discipline that we have to undergo.

Urinals should be installed in the villages to collect and utilize the manurial nutrients contained in it. A simple and efficient urinal, the 'Utility Urinal', has been devised by the State Agriculture Department.

(4) In most of the villages no effort is made to utilise house hold or kitchen wastes and sweepings for manure purposes. It is suggested that every householder should keep an empty tin or an earthen vessel for storing the household wastes and utilise the material so obtained for compost manure preparation.

(5) Store the manure in trenches or pits. With a view to preventing excessive losses of organic matter or the plant nutrients, it is most essential that all available wastes collected in villages are thoroughly mixed, moistened, and stored in trenches. The dimensions of the pits would vary according to the size of the household and the number of cattle maintained by each householder.

Preparation of Compost Manure in Trenches

The size of the trench recommended for each farmer would vary according to the number of cattle maintained by him, the idea being that a trench should be able to hold the collection of litter, dung etc. obtained over a period of about three months. It is, therefore, advisable that each farmer should have two to three trenches, so that when the first trench is filled up the second one could be taken up for filling. By the time the second trench is filled up the manure in the first one would be ready for use.

The trenches should be long and narrow, and should be filled up in fractions from one end, the idea being that refuse wastes are not unnecessarily exposed to the sun and air and that proper fermentation is allowed to take place without much loss of moisture.

The following sizes of trenches are recommended according to the number of cattle maintained by each farmer:

Number of cattle	Dimension of the trench		
	Length	Breadth	Depth
2 to 5	20 ft.	4 ft.	3 ft. on one side and $3\frac{1}{2}$ ft. on the other
6 to 10	30 ft.	5 ft.	-do-
11 and above.	50 ft.	7 ft.	-do-

The bottom of the trench should have a slope of 6 inches from one end to the other, so that rain-water accumulates only at one end and does not spoil the manure. The trenches should preferably be located at a higher ground level so that seepage water does not flow in.

Collection and mixing of the available refuse waste: All available refuse wastes, including crop wastes, street and household sweepings etc., should be collected at one place near the cattle shed, and a portion of these should be spread under the cattle every evening. In the morning this bedding together with dung and urine should be collected and thoroughly mixed and moistened with water.

Fractional filling of the trenches: With a view to preventing the loss of plant nutrients by drying through excessive exposure to the sun it is recommended that the trenches should be filled up according to the following procedure of fractional filling:

(a) Demarcate two to three feet length of the trench from the shallower end with the help of a partition made of wood or bamboo sticks, jowar or maize karbi or cotton sticks etc.

(b) Put the total stock of the mixed wastes in the demarcated portion of the trench and cover it with a sprinkling of dry earth.

(c) Repeat the procedure daily till the demarcated portion is filled up to a height of about 1 ft. to $1\frac{1}{2}$ ft. above the ground level. This would normally take five to seven days.

(d) Cover the top with 1 to 2 inch layer of dry earth in the plains or drier regions, or plaster it with a mixture of cow-dung and earth in the hilly tracts where rains are usually heavy.

(e) Shift the partition further and demarcate another 2 ft. to 3 ft. length of the trench and repeat the procedure till the whole trench is filled up.

By following the above procedure we will not only get a very good quality of manure but a much larger quantity of it also, because the storage of the refuse wastes in trenches prevents the loss of valuable plant nutrients, like nitrogen, phosphorous, and potash, and also prevents loss of the carbonaceous material by restricting the air supply.

Suitable Mixtures of Fertilizers

Name of crop	Dose of fertilizer recommended (per acre)	Expected increase in yield per acre (mds.)	Net gain per acre (Rs.)	Remarks
1. Wheat	50 lbs. N. or 250 lbs. Ammonium Sulphate and 20 lbs. P_2O_5 or 150 lbs. Superphosphate.	6—8	20—25	Dose of fertilizer may be increased in the case of poor soils.
2. American Cotton	2½-3 maunds Ammonium Sulphate.			To be applied before flowering. The dose may be increased to 6 maunds with advantage.
3. Maize	50 lbs. N. or 250 lbs. Ammonium Sulphate and 50 lbs. P_2O_5 or 250 lbs. —— Superphosphate.	10—13	25—50	High dose both of nitrogen and P_2O_5 has been found to give economical increase in yield in certain soils.
4. Sugarcane	70 lbs. N. or 4¼ mds. ammonium sulphate.			To be applied in conjunction with 7-8 cart loads of farm yard manure and 10-15 mds. of ground-nut cake.
	140 lbs. N. or 8* mds. ammonium sulphate.			When applied alone on soils of average fertility.

Name of crop	Dose of fertilizer recommended per acre	Expected increase in yield per acre (mds.)	Net gain per acre (Rs.)	Remarks
5. Paddy	50 lbs. N. or 250 lbs. Ammonium sulphate & 20 lbs. P_2O_5 or 125 lbs. superphosphate.	8—10	20—40	
6. Potatoes.	100 lbs. N. and 100 lbs. P_2O_5 or 150 lbs. superphosphate.	50—60	90—140	(Plains)
	750 lbs. ammonium sulphate and 75 lbs. P_2O_5 or 350 lbs. superphosphate.	70—100	150—300	(Hills)
7. Vegetables.	100 lbs. N. or 50 lbs. P_2O_5 and 50 lbs. Potash.			
8. Malta (per tree) Oranges.	2—3 years. ¼ sr.			In conjunction with F.Y.M. 6—10 srs.
	4—6 years ½ to 1 sr.			—do— ,, 15—30 srs.
	7 years and above 1½ to 2 srs.			—do— ,, 40—50 srs.
				The F.Y.M. to be applied during the 2nd half of January. Ammonium Sulphate to be applied 3 weeks before flowering.

USEFUL INFORMATION

SOIL ANALYSIS (per 100 grams Air Dried Soil)							SOIL REACTION & WATERSOLUBLE SALTS		
Soil Fertility Status	Total			Available		Organic Matter		pH	% Water-soluble Salts
	N	P_2O_5	K_2O	P_2O_5	K_2O				
Rich	0.08	0.15	0.30	0.035	0.040	0.8	Acid Soils	Below 6.5	Below 0.05
Fair	0.06	0.10	0.20	0.015	0.015	0.7	Normal Soils	6.5 to 8.0	0.1 to 0.25
Poor	0.04	0.07	0.15	0.008	0.007	0.5	Saline Soils	7.5 to 8.6	above 0.25
Vey poor	0.03	0.04	0.08	0.004	0.004	0.4	Alkaline Soils	9.0 to 10.5	0.25 to 0.50

MANURIAL SCHEDULE FOR DIFFERENT CROPS PER ACRE

Name of Crop	Rate of Application			Expected increase in yield	Net gain	Time of application
	Super-phosphate	Amm. Sul.	Pot. Sul.			
	Mds.	Mds.	Mds.	Mds.	Rs.	
Sugarcane (Irrigated)	4 – 5	5 – 6	—	200 – 250	200 to 250	Superphosphate before planting S/A—½ at sowing and ½ with irrigation or during Monsoon
Sugarcane (Unirrigated)	3 – 4	2 – 3	—	100 – 120	80 to 100	
Potato	6 – 8	6 – 8	0 – 2	100 – 120	300 to 400	Superphosphate Pot. Sul. and ½ S/A before planting and ½ S/A at earthing up
Wheat (Irrigated)	2 – 3	2 – 2½	—	8 – 10	70 to 80	Before sowing
Wheat (Unirrigated)	1½ – 2	1 – 1½	—	4 – 6	30 to 40	Before sowing
Paddy	2 – 2½	1½ – 2	—	10 – 15	65 to 100	½ at puddling & ½ at hoeing
Maize	2 – 3	2½ – 3	—	12 – 15	50 to 60	Before sowing
Cotton	1½ – 2½	2 – 3½	—	4 – 5	80 to 120	½ before sowing and ½ at flowering
Tobacco	3 – 4	4 – 5	1 – 2	2 – 3	70 to 120	½ before sowing and ½ at hoeing
Vegetables	2 – 6	2 – 6	0 – 2	—	—	At sowing, before transplanting and at hoeing
Lawns	2	2	—	—	—	After mowing
Fruit, per plant	2-4 lbs.	2-4 lbs.	½-1 lb.	—	—	Before flowering
Flowers, per plant	1-1½ oz.	½-1 oz.	½-1 oz.	—	—	

ANALYSIS OF PRINCIPAL FERTILISERS AND MANURES

Product	Percentage			Product	Percentage		
	N	P_2O_5	K_2O		N	P_2O_5	K_2O
Sulphate of Ammonia	20.6	—	—	Bone Meal (steamed)	1—2	21—24	—
Nitrate of Soda	15.5	—	—	Rock Phosphate	—	20—39	—
Nitrate of Potash	14.0	—	14—15	Sulphate of Potash	—	—	48
Nitrate of Ammonia	34.4	—	—	Wood Ashes	—	—	12—16
Urea	44—46	—	—	Ground Nut Cake (Decorticated)	7.0	1.8	2.6
Ammonium Sulphate Nitrate	26	—	—	Ground Nut Cake (Undecorticated)	5.0	1.8	2.6
Amophos	16	20	—	Mohwa Cake	2.8	1.0	1.5
Superphosphate Single	—	16—20	—	Mustard Cake	5.0	2.5	1.5
Superphosphate double or triple	—	40—45	—	Farm Yard Manure	0.5	0.25	0.40
Bone Meal	3—4	20—22	—	Compost	0.4	0.25	0.8

AREA

One Acre = 4840 Sq. Yds. = 43560 Sq. Ft. = 8 Kanals = 2 Bighas or app. 5 kacha bighas in Punjab and adjoining States or 2 Pucca bighas or 6¼ kacha bighas = 1 Bigha and 12 Biswas in Eastern U.P. & Bihar.

One Bigha = 20 Biswas

One acre inch Irrigation = 100 tons = 22400 gls. = 1 cusec for 1 hour.

One acre 9" average soil = 1300 tons.

Weight of One cft Water = 62.5 lbs.
" One " Soil = 92.0 "
" Compost = 28.0 "
" Wheat = 51.4 "
" Coal = 53.0 "

WEIGHT

One long ton = 2240 lbs. = 27 mds. and 9 srs.
One cwt = 112 lbs. = 1 md. 14 srs. and 7 chks.
One short ton = 2,000 lbs. or 0.9 long ton.

One Metric ton = 2204.6 lbs.

One Md. = 82.23 lbs.

* Source : Table Calendar, D.C.M.

CHAPTER 20

JAPANESE METHOD OF PADDY CULTIVATION

Paddy land should be ploughed right after the harvest. If ploughing is not done after harvest the land should be dug up and clods broken.

The nursery seedbed should be four feet wide and three inches above the level of the ground and of any handy length. A space of 1 foot wide should be left in between the beds. This will allow working and weeding of the seed bed without injuring the plants.

Twenty pounds or ten seers of seed is sufficient for an acre and should be sown in 1/20 of an acre for nursery purposes. The beds may be sown at the rate of one pound per 25 feet.

About one maund of compost or cowdung manure should be mixed with the soil for each twenty five feet of bed, followed by one pound of a mixture of equal quantities of ammonium sulphate and superphosphate.

The soil should be smoothed and covered with manure about 1/8 inch thick, and finally covered with a thin layer of ashes. The bed is now ready for sowing. The seeds should be put in a bucket of salt water and stirred with hand. The poor seed will float up to the top, and should be skimmed off. Only the heavy seeds at the bottom of the bucket should be used for planting. Seven or eight days after the seedlings have come up, weeds should be removed. The seedlings will be ready for transplanting when the sixth leaf has formed. At this time the plant will be 6 to 8 inches high. It is better to do transplantation early than late.

Transplanting :

The field should be ploughed and prepared well for transplanting of the nursery. Fifteen to twenty cartloads of compost or cowdung manure are needed for each acre. This manure should be ploughed into the land before puddling. One hundred pounds of

ammonium sulphate mixed with 100 pounds of superphosphate may be used on each acre.

The nursery beds should be irrigated a day before the seedlings are to be removed. They should be pulled out one at a time and care should be taken not to bruise the stems or break the roots.

More than four seedlings should not be planted in a hole.

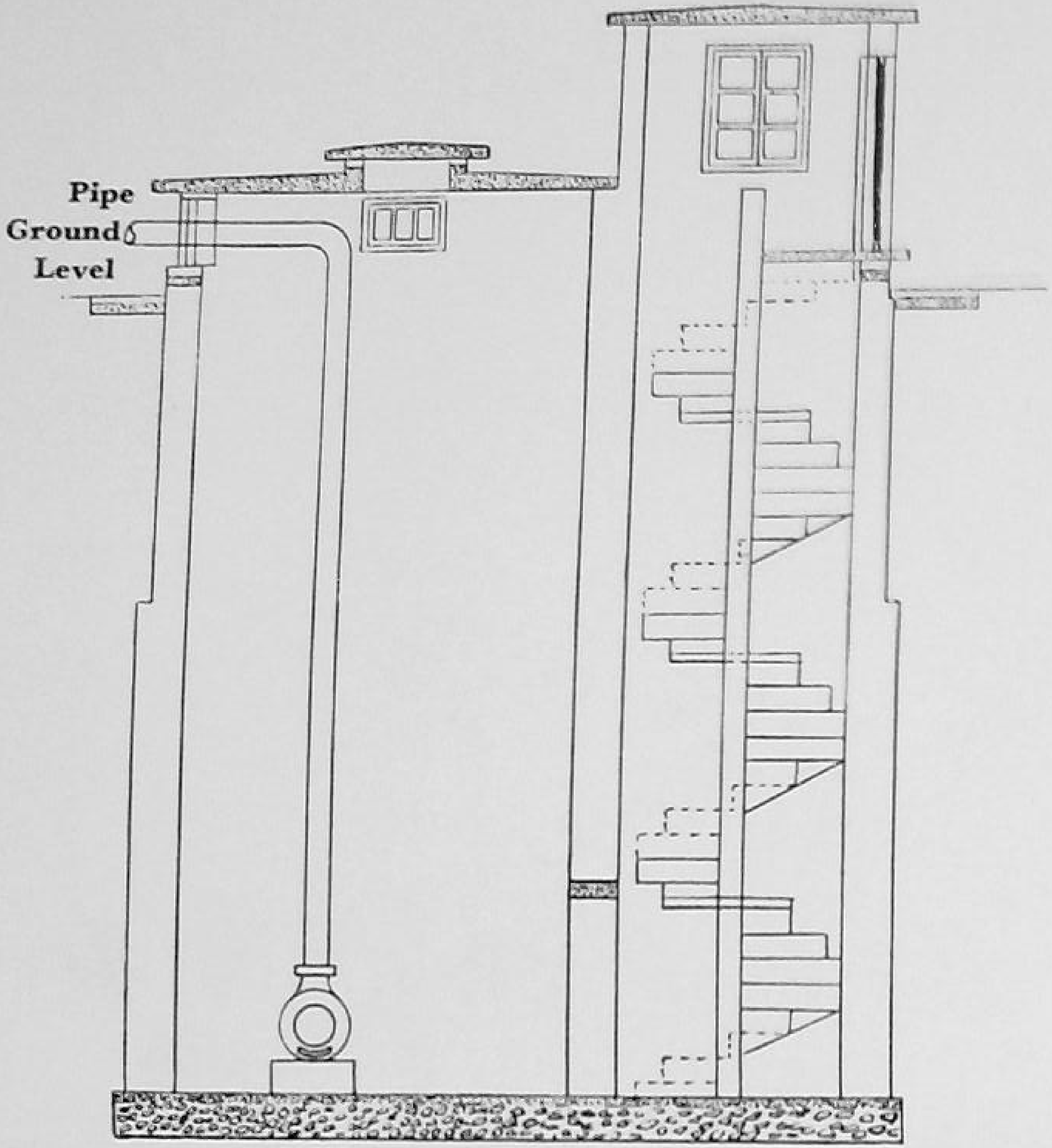
By this method the seedlings are planted straight up rather than at any angle. The fingers should be held along the side of the plants and pushed into the soil ahead of the seedlings.

The seedlings should be planted at distances of 6 inches from plant to plant and 9 inches from row to row.

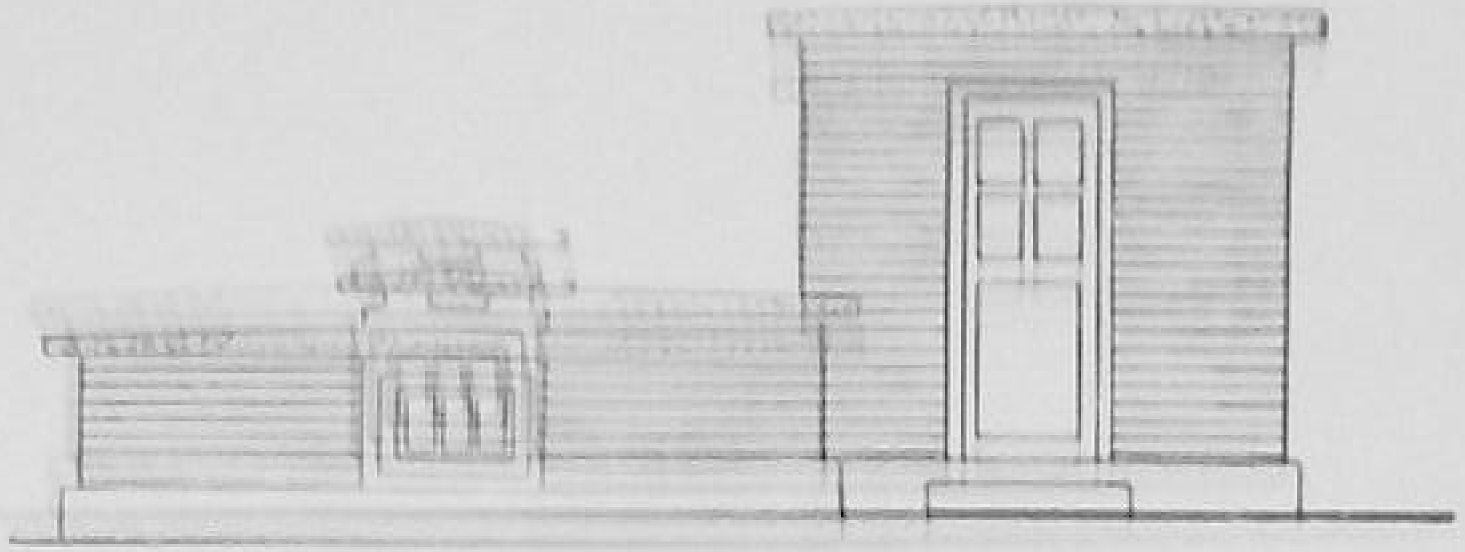
After the crop has grown for two weeks, all weeds should be removed. To get the highest yield 100 pounds of ammonium sulphate mixed with 100 pounds of superphosphate should be applied one month after transplanting. This manure should be worked into the soil around the roots of the plant.

From time to time a soil scratching tool should be moved between the plants. About two weeks before flowering, field work should stop. Any more cultivation will lower the yield.

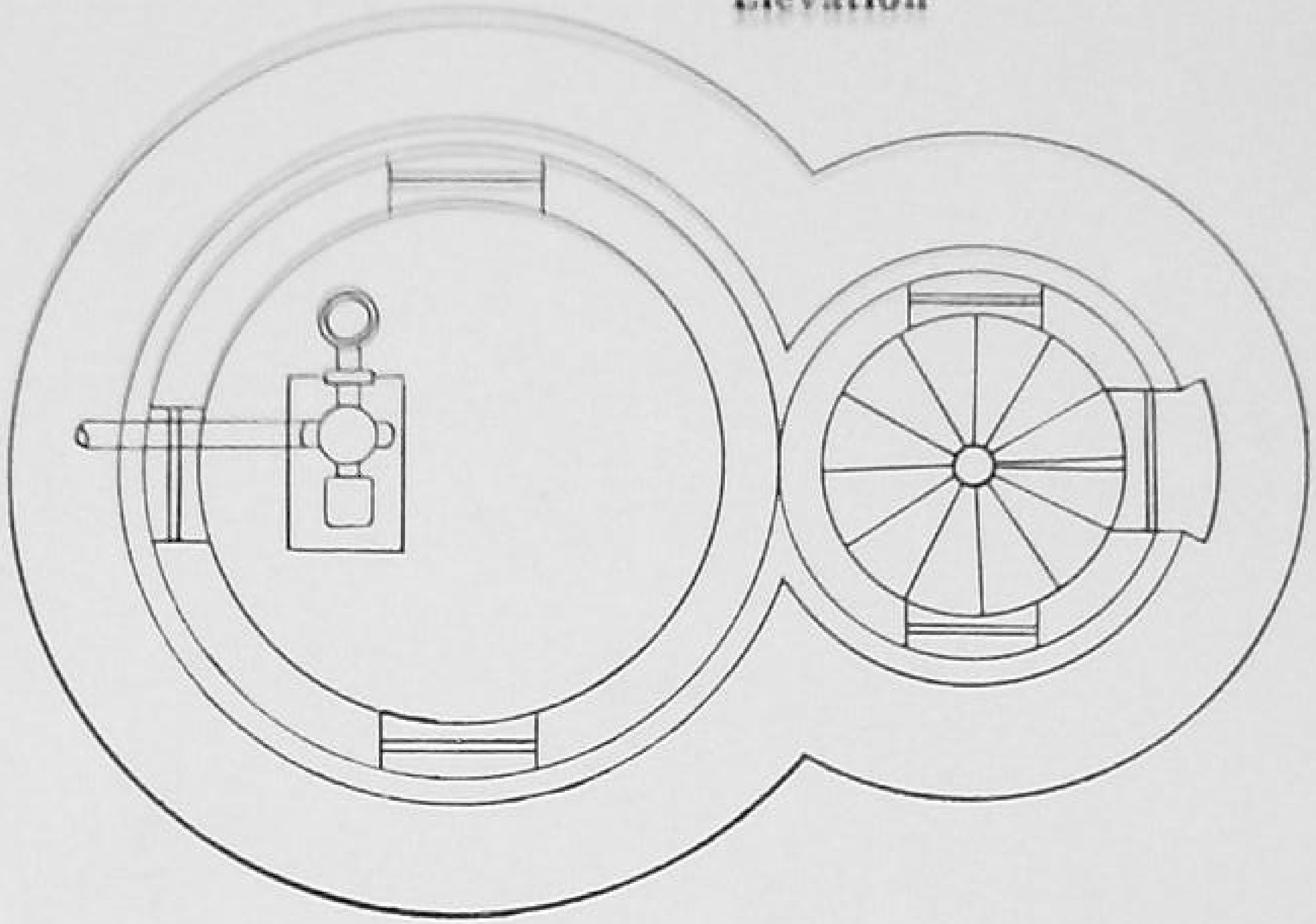
A TUBEWELL



Elevation Section



Elevation



Plan

CHAPTER 21

IMPROVED IMPLEMENTS

As agricultural implements are generally dear, the Agriculture Department has appointed fabricators at many places in the State, who manufacture the implements and sell them to the cultivators at prices fixed by the Department. The department supplies to these fabricators iron and steel at controlled rates.

The list of improved Agricultural implements, the supply of which is arranged by the agriculture Department through its approved fabricators, is given below:

1. Power Wheat Thrashing and Winnowing Machine.
2. Hindustan Plough.
3. Meston Plough.
4. Kisan Hoe.
5. Single Row Cotton Drill.
6. Automatic Rabi Drill.
7. Cane Crushers.
8. Sugarcane juice boiling pan.
9. Persian Wheel.
10. Chaff-cutter.
11. Bar Harrow.
12. Triphali.

The district staff of the Agriculture Department visit villages in Development Areas, give lectures, arrange meetings, lay out demonstration and trial plots on cultivators, lands, put up agricultural shows, hold produce and ploughing competitions, lend improved agricultural implements, and organize campaigns against pests and diseases. These contacts have improved the standard of farming considerably.

In order to increase yields of crops, crop competitions are held at Village, Tehsil, District and State Level. Prizes are awarded to the cultivators who produce the highest yield per acre.

Japanese method of rice cultivation has been introduced in the State, since Kharif 1953. By adopting this method of paddy

cultivation, about 6½ maunds of paddy per acre, is obtained as an additional yield.

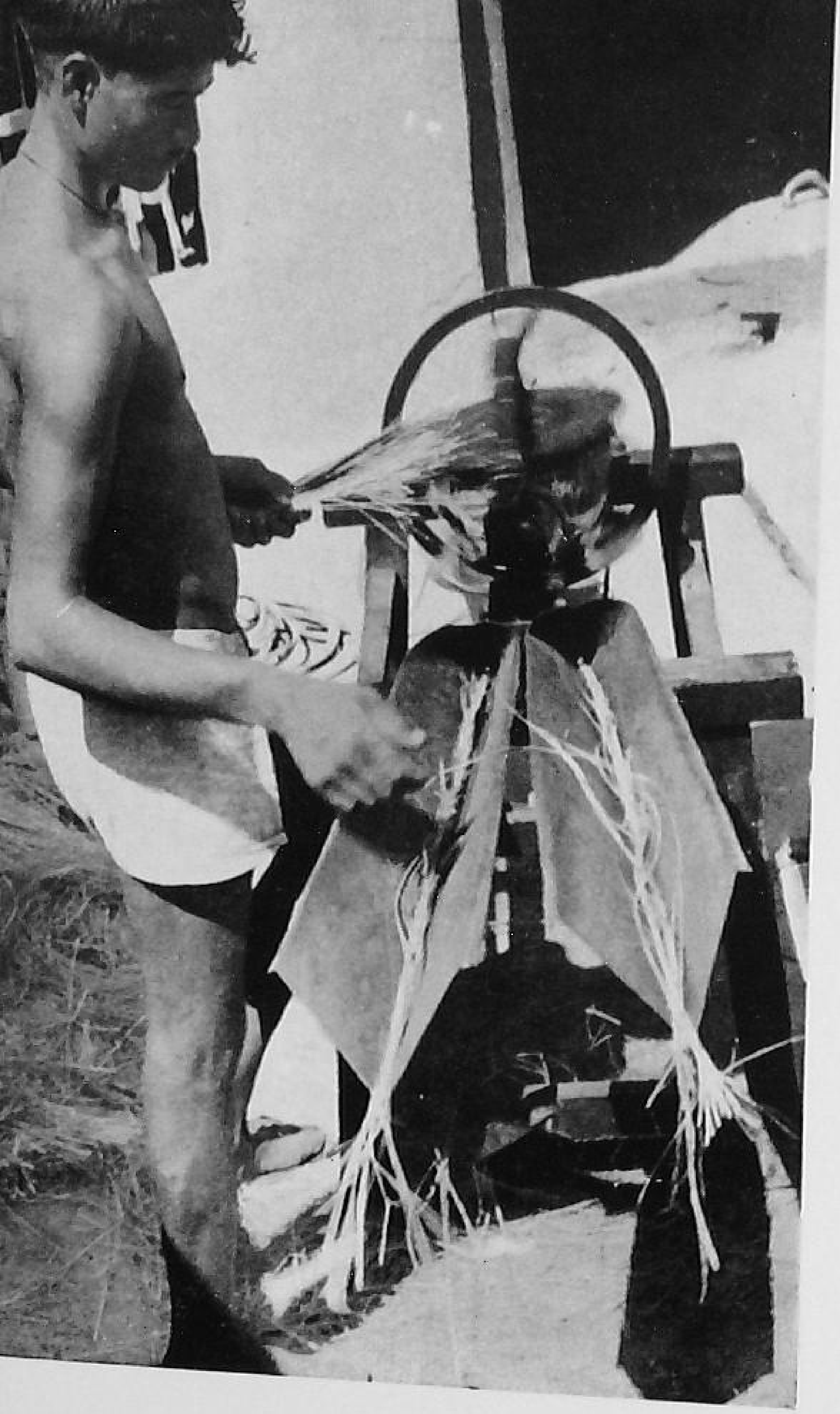
In order to make the best use of the young men in villages, and to bring about agricultural improvements, 4-H Clubs, or Youth Clubs are organised. These young men are acquainted with sound agricultural practices, and Grow More Food Schemes in operation in the State. Such clubs are proving very useful.

To bring about all-round improvement, model villages are being organised. This is proving very useful in stepping up production of crops.

In addition to the above measures, leaflets and pamphlets are distributed, fortnightly radio talks are broadcast, films on interesting items are displayed and charts and posters distributed.

Electric chaff-cutter which automatically removes dust from fodder.

Pumping sets are eliminating drudgery of drawing water from wells.



A simple machine for rope-making

A new, chaff cutter

CHAPTER 22

VEGETABLE GARDENING

Vegetables are a valuable source of vitamins and minerals which are recognized to be very essential for good health. Most of the vegetables possess a natural appetizing flavour on account of the presence of free organic acids, and are both palatable and helpful in the normal working of the digestive system. Besides, vegetables are the main source of 'roughage' which is needed to keep the muscles of the intestinal tract in condition to ensure proper elimination of body wastes. It is, therefore, necessary to include substantial amounts of fruits and vegetables in our daily diet.

Vegetable growing yields a much higher income per acre than any other type of farming. The reason of this lies in the fact that the vegetable grower can get two to three crops annually from the same plot of land because vegetable crops are short-duration crops. He can employ all his family labour to the best advantage all the year round for raising vegetables.

Cropping Scheme

In view of the importance of vegetables in dietary as well as in agricultural economy every peasant and a kitchen gardener should be induced to grow sufficient vegetables for himself as well as for marketing. The following scheme of cropping for both winter and summer for a small family-garden should serve as a helpful guide in making a workable plan which may be changed according to local conditions.

Cropping Scheme for winter vegetables for 1/8 acre plot.

Garlic	½ marla	Knol khol	½ marla
Peas	3 marlas	Cauliflower	2 marlas
Onion	2 marlas	Potato	2 marlas
Carrot	2 marlas	Turnip	3 marlas
Palak	1 marla	Radish	½ marla
Methi	½ marla	Coriander	
Cabbage	1 marla	Mint, beet etc.	1 marla

Cropping Scheme for Summer vegetables for 1/8 acre plot.

Tinda	4 marlas		Tar	1 Marla
Potato	2 ,,		Tomato	1 ,,
Bhindi tori	2 ,,		Brinjal	1 ,,
Chillies	1 ,,		Sweet potato	1 ,,
Karela	1 ,,	(16½×16½)	Colocasia	1 ,,
Ghia Kaddu	2 ,,		Cucumber	1 ,,
Halwa Kaddu	2 ,,			

Winter Vegetables

Cold Weather Crops

(*a*) This group includes cabbage, cauliflower and knol khol belonging to the genus Brassica. These are essentially cold weather crops, and are grown in the Punjab during winter. In fact, these attain their best development when the season remains cold for sufficiently long time. When raised under warm conditions the produce becomes pungent. These crops require a long growing period. Therefore, in order to save time and to obtain early production, the seed is sown in nursery beds for transplantation in the field at the proper time.

Growing seedlings in the nursery: The nursery bed should be located in a protected place, the level of which should be 6″ higher than the rest of the field. The soil should preferably be sand loam. The area should be prepared about 6 months in advance by the application of well rotted farm-yard manure, compost and fertilizers. A 2-inch layer of compost should be spread on the top of the bed, and mixed to a good tilth. When the soil has been thoroughly prepared, small beds of convenient size that can be weeded without entering the plots should be made. The seed may be sown either in rows or broadcast, and covered lightly with soil or compost.

After sowing, the seed bed should be watered immediately using a fine spray from the sprinkling can. Until the plants are established the seed bed should never be allowed to dry up, nor should it be kept soaked with water but adequate water should be supplied to keep the soil moist. After the seed has been sown B.H.C. 5% (Gammaxane) should be strewn round the seed bed in a small band to keep the ants away. Seedlings when about 5″ to 6″ tall and about six weeks old are ready for transplantation.

Sowing time and seed rate: In the hills the seed is sown in the nursery bed from March to July and in the plains from the middle of August to the end of October. Seed of acclamatized cauliflower varieties may be sown from the middle of June to the middle of September, and that of imported varieties from the middle of September, to the middle of October.

The seed rate for cauliflower, cabbage and knol khol is ½ lb., ¾ lb., and 3 lbs. respectively. One marla (272 Sq. ft.) should be sown to every four ounces of seed.

Soil and its preparation: Thoroughly prepared heavy soils are required for the production of these crops. Soils of very light texture should never be used unless these are abundantly supplied with organic matter.

Manures and fertilizers: Thirty to forty tons of farm-yard manure or city compost per acre should be applied to the soil at least a month before preparing the soil for seed bed. Five to six maunds of ammonium sulphate should be applied in two to three dozes after transplanting the crop.

Method of sowing: Cauliflower and cabbage seedlings are transplanted in rows 2′-2½′ apart, and plants about 15″ to 18″ from each other depending upon the variety, the tall-growing varieties being spaced wider. Knol khol seedlings are transplanted in rows 18″ apart, and plants spaced 6″ asunder. Transplanting should invariably be done either on rainy days or in the evenings. Watering should be done immediately after transplanting. Subsequent waterings may be given every 10 to 14 days. If necessary, early cauliflower may be irrigated at shorter intervals. Between irrigations, when the soil gets into workable condition, weeding should be done and continued till the leaves cover the soil.

Varieties

Cauliflower:

Early varieties: Kunwari, Patna, Katki and Giant Snow Ball (Punjab Agri. Deptt.)

Late imported varieties: Snow Ball and China Pearl.

Cabbage:

Early varieties: Pride of India, Golden Acre, and Early Drum Head (Pb. Agri. Deptt).

Late varieties: Drum Head Late (Pb. Agri. Deptt.) Glory of Enkhuien and Cope hegan Market.

Knol Khol:

Early varieties: Earliest White (Pb. Agri. Deptt.) Early Purple.

Late varieties: Vienna Late.

Root Crops

This group includes carrots, radish and turnips. They thrive best in cold season, but are also tolerant of high temperature, especially the radish. They are usually grown on ridges in order to facilitate drainage and to suppress the production of branched, mis-shapen and unsightly roots. Application of excessive manure and fertilizers and irrigations should be avoided, especially in the case of carrots.

Sowing time and seed rate:

Radish: At the earliest, the radish can be sown from the middle of June onwards although the main season is from August to January. The European varieties are sown from September to March. In the hills the radishes are sown from March to the end of October.

Turnips: The Indian varieties of turnips are sown in the plains from July to September, and the European types from October to December. In the hills the early crop is sown from March to the end of May, and the late crop from August to September.

Carrot: Carrot is sown in the hills from March to the middle of July, and in the plains acclamatized types from the middle of August to the end of October, and the European types from the middle of September to the end of November. The seed rate for radish, turnip, and carrot is 3 lbs., 8 lbs. and 16 lbs. per acre respectively.

Soil and its preparation: These crops require rich sandy loam, loose, friable soils for their best development. The land should be thoroughly prepared to make a mellow bed.

Manures and fertilizers: A light dose of farm-yard manure at the rate of 10, 12, and 16 tons per acre for turnip, radish, and carrot, respectively is required. Ammonium sulphate at the rate of 1½ to 2 maunds per acre may be given as a side-dressing.

Method of sowing: All these crops should be sown on ridges 1½ feet apart. A small furrow about 1½" wide is made on top of the ridge with hand or with the sharp end of a stick. The seed mixed with coarse sand is dropped in the furrow with the hand and covered lightly with the earth, firming the soil around the seed. Irrigation should be applied between the ridge immediately after sowing, taking care that no parts of the ridges are submerged, subsequent irrigation may be applied after every 4 to 5 days during the hot weather and 8 to 10 days during the cool weather. Carrot does not require so much watering, but during the germination period the soil should be kept moist until the seedlings come out. Watering may be done fortnightly during the hot weather and sparingly during winter. The crops should be kept clean of weeds especially during the early stages of growth, when the plants are too small to compete with the weeds. Crowded plants do not grow good roots ; therefore, thinning and proper spacing of the plants in the rows at the right stage is necessary.

Varieties

Turnips:

Early season: 4 Red and 4 White (Pb. Agri. Deptt.).

Late season: European types, Snow Ball, Golden Ball and Purple Top (Pb. Agri. Deptt.).

Radish: Long White, Long Red, Acclamatized White No. 5

European: White Icicle, Scarlet Globe.

Carrot: Acclamatized No. 29 (orange) No. 27 (Black)

European: Nantes and Golden Heart.

Bulb Crops

This group contains onion and garlic belonging to the family Liliaceae. The flesh of the bulbs in these crops comprises the swollen bases of the green foliage leaves and fleshy scales. The seed stalk of the plants in these crops grows out of the centre of the stem, and bears bulbils and umbles of flowers.

Sowing times and seed rate: The best time for sowing onion seed in the nursery bed for raising transplants is from middle of October to first week of November, and for garlic, which is sown from cloves directly in the field, is from September to October in the plains and during March to May in the hills. The seed rate for

the onion is about 8 lbs. per acre, and that for garlic 652 lbs. Onion seed should be sown at the rate of 2 lbs. per marla seed-bed space. The onion seedlings will be ready for transplanting within 6 to 8 weeks.

Soil and its preparation: For their best development these crops should be sown on well drained, loam-soils, well supplied with humus. The land preparation must be prepared for a fine, firm and smooth seed bed. Deep ploughing is not essential as these are small root crops.

Manures and fertilizers: As pointed out above, these crops require a soil rich in humus. It is necessary, therefore, to manure the soil fairly heavily. About 15 to 20 tons of manure should be applied to the field and ploughed into it, at least a month before transplanting. Ammonium sulphate should be applied as a side-dressing at the rate of 3 maunds per acre at the time of planting and another 3 maunds one month after planting.

Method of sowing: Onion seedlings when ready are transplanted in small plots of convenient size for irrigation, and put in rows 9″ to 12″ apart ; the seedlings are sown at a distance of 3″ to 4″ from each other. The plots are irrigated immediately after transplanting.

For planting garlic, the field is usually divided into small 'Kyaries'. The cloves are put 3″ asunder in rows 6″ apart; or small furrows are made 6″ apart with the sharpened end of a stick and the cloves with the sharp growing ends upwards are dibbled 2″ deep and 3″ apart and covered with soil lightly. Irrigation is applied immediately. Subsequently the crops are irrigated every 10 to 14 days, and kept clean of weeds by hoeing between the rows and around the plants. The crops are irrigated sparingly when nearing maturity.

Varieties

The important onion varieties are Large Red, Patna Red, Patna White, and Yellow Globe. In garlic no distinct varieties are recognised by the trade, but stocks varying in the size of the bulbs and coloration of sheaths, and size and number of clobes are met with. Usually the varieties cultivated in the hills have bolder bulbs as well as clobes than those grown in the plains.

Peas and French beans belong to the family Leguminaceae. These are known as soil enriching crops as they are capable of utilizing the nitrogen from the air through nitrogen fixing bacteria found in the nodules of their roots.

Leguminous Crops

Sowing time and seed rate: These crops are sown from the middle of August to the end of October, and a second crop of beans may be sown in February in the plains. In the hills these are sown from April to June and a second crop of peas may be sown in October. The seed rate for peas in 30 lbs. per acre and that for beans is 40-60 lbs.

Soil and its preparation: Peas and beans can be sown on all kinds of soils, varying from light loams to heavy clay. The land should be well prepared and pulverised to make a smooth seed bed.

Manures and fertilizers: Thoroughly decomposed manure should be added at the rate of at least 8 tons per acre and worked in the soil fairly deeply where the roots can find sufficient food. Potassium sulphate should be added to the soil at the rate of 2 maunds per acre, and a light dressing of ammonium sulphate, say at the rate of one maund per acre, may be given at the time of pod formation.

Method of sowing: Peas and beans should be sown near the edges of the raised beds with irrigated furrows between the beds. For peas the width of beds varies from 3 to 5 feet depending upon the variety sown. For beans the width of the beds is usually 3 feet. The seeds should be dibbled 1″ to 1½″ apart, and the soil firmed around them. Irrigation should be given in the irrigation furrows immediately after sowing, taking care that no parts of the beds are submerged. Seeds will break ground in 6-8 days. When the plants are about 6″ high, the tall growing varieties should be staked. The crop should be irrigated every 10 to 14 days, and kept clean of weeds by weeding with 'Khurpa' in the early stages and pulling out weeds with hand when the crop is fully grown.

Varieties

Peas

Early varieties: Lucknow Dwarf, P. 23 and P. 8 (Pb. Agri. Deptt.).

Main season, and late varieties: P. 35, P.44 (Pb. Agri. Deptt.). American Wonder, Thomas Lexton, Marrow Fat.

French beans: Bountiful, Kentucky, Wonder, Dwarf, Chocolate and Sure Crop (Pb. Agri. Deptt.).

Leafy Vegetables

These crops belong to two different families. Spinach and Indian spinch-beet to the family Chenopediaceae and Fennugrick to the family Leguminaceae. All these crops thrive at a low temperature and have similar cultural requirements. They are easy to grow. Their leaves are a rich source of minerals and vitamins.

Sowing time and seed rate: Palak and *methi* are popularly grown in the plains. True spinach or Kandiari palak is also grown to a certain extent as a late crop in September to November and in February as it cannot stand the heat. Palak is sown from June to the middle of November, and in February. Methi is sown from September to November. In the hills Kandiari palak is popular, and is sown from March to April and in September-October. The seed rate for palak, Kandiari palak, and methi is 30 Lbs., 20 Lbs. and 18 Lbs. respectively.

Soil and its preparation: The crops are sown on all types of soils, but the heaviest yields are obtained on clay loams. The land should be ploughed 3 times and planked smooth for the preparation of seed bed.

Manures and Fertilizers: For quick growth these crops require plenty of nutrients. Therefore the land should be manured at the rate of 15 tons per acre. To stimulate growth, a top-dressing of ammonium sulphate at the rate of 1½ maunds per acre should be given after the first and second cutting.

Method of sowing: The seed bed is ridged into plots convenient for irrigation. The seed is then sown broadcast, and the surface of the bed is raked to cover the seed. An irrigation may be given immediately followed by subsequent irrigations after every 8 to 10 days. The weeds should be pulled out by hand.

Varieties

Palak No definite varieties are recognized by trade.

Kandiari Palak Prickly seeded varieties are more popular than round seeded ones.

Methi: There are no distinct varieties except the so-called 'Kasuri Methi' and 'Scented Marwari.'

CHAPTER 23

SUMMER VEGETABLES

In this group are included tomato, eggplant, and pepper or chillies which belong to the family Solanaceae. These crops are usually grown from transplants which are raised in the nursery bed. All the crops are very susceptible to virus diseases and serve as hosts to many other diseases and insect pests.

Solanaceous Fruits

Sowing time and seed rates: In the hills the seed for raising transplants is sown in March-May. The crop bears fruit from July onwards. In the plains sowings are made in October-November for raising seedlings to be planted during February. In the case of chillies only vegetable types are sown at this time. The seed for the other two crops of tomato is sown during June, and August to middle of October, and that for eggplant in March-April and August-October. The seed of red chillies is sown in May-June for the production of transplants, and in March when the crop is to stand on the spot. About one pound of seed is sufficient to produce seedlings for one acre

Raising of seedlings in nursery: The seed is sown broadcast in a well prepared nursery bed. Irrigation is given immediately after sowing. Two to three ounces of seed should be sown per marla (272 sq. ft.). For hot weather sowings, provision should be made to shade the bed till the seedlings have established themselves well. While the seedlings are germinating, the seed bed should be protected from heavy rains ; otherwise germination is impaired. The seed bed should be watered regularly till the plants have grown an inch tall when watering should be done sparingly. When the plants are about 3-4 weeks old and about 5" to 6" tall they are ready for transplanting.

Soil and its preparation: These crops show their best development in silt loam and clay loam soils. The soil should be thoroughly pulverised before beds are made for receiving the seedlings.

Manures and fertilizers: Well-rotted farm-yard manure at the rate of 15 to 20 tons per acre should be applied to the field well in advance. In the case of chillies the manure should preferably be applied to the preceding crop to minimise the risk of white-ant attack. These crops respond well to the application of ammonium sulphate which should be applied in two or three doses at the rate of 1 to 1½ maunds after transplanting.

Method of sowing: The seedlings should be removed from the nursery seed bed with soil sticking to the roots, and planted in the field in rows 2-3 feet apart, the distance between the plants being 15″ to 18″, depending on the variety—the tall growing varieties to be spaced farther than others. In the case of chillies, however, the plants in the rows are spaced close, *i. e.*, about 9″-12″ apart.

The transplanting should invariably be done on rainy days or in the evenings, and irrigation should be applied immediately. Tomatoes may need staking which should be provided when the plants are 9″ to 12″ tall. In humid regions there is not much need for irrigation but in dry season irrigation should be given every week during the hot weather ; in winter the crops should be watered sparingly. Inter-tillage and hoeing should be done as required to keep the weeds in check.

Varieties

Tomato: Bonny Best, Best of All, Large Red, Rutgers, Marglobe.

Egg plant: Black Beauty, Long Black, Long Purple, Round Purple, Round White and Long White.

Chillies: Hot Types, Sanauri, Patna Red and Sirhindi. Bell Pepper—Chinese Giant, California Wonder and World Beater.

Lady's finger or Okra or Gumbo

Bhindi tori: Belongs to the family Malvaceae. In the plains two crops, one early, sown from February to March, and the other late, sown in July, are raised. In the hills the seed is sown from April to July. The seed rate varies from 8 to 10 lbs per acre.

Soil and its preparation: Okra thrives in all kinds of soil, but it grows best in a friable, well-manure soil. The land should be ploughed 3 to 4 times before preparing the seed bed.

Manures and fertilizers: Ten to fifteen tons of well rotted farm-yard manure or city compost should be added before preparing the seed bed. A side-dressing of ammonium sulphate at the rate of 1½ maunds per acre should also be given when the plants commence pod-formation.

Method of sowing: The seed coat in Okra is hard; therefore, it is advisable to soak the seed 24 hours before sowing. It is sown in rows 1½′ to 2′ apart. The seed is sown thickly 1″ to 1½″ deep, and later the plants are thinned, 9″ to 12″ apart. Early crop may preferably be sown on ridges. After sowing, irrigation should be applied immediately between the furrows. During hot weather the crop should be irrigated every 5th or 6th day, and at 10-14 days' interval during the cold season. The crop is weeded twice or thrice.

Varieties

Early varieties: No. 13 (Pb. Agri. Deptt.) Lucknow Dwarf.

Main season varieties: Long Green, Long Green Velvet, and mooth Green Velvet.

Vine Crops

All the crops included in this group belong to the family Cucurbitaceae and are grown for their ripe or unripe fruits. These crops generally thrive only in hot weather and have similar requirements. They are insect-pollinated, and are trailers excepting the bush varieties of squash. The most important are melons, gourds and squashes.

Musk melon and Long melon: Musk melons are grown extensively for their ripe fruits used as dessert, and long melons for their young and tender fruits taken raw as salad.

Sowing time and seed rate: In plains the seed is sown from January to the middle of March, but the best time of sowing is the middle of February. In the hills these crops are not usually grown. Three to four pounds of seed is sufficient for an acre.

Soil and its preparation: These crops are sown on a variety of soils, but rich loamy soils are the best. Heavy clays and water logged soils should be avoided. The seed bed should be prepared by thoroughly pulverising the soil and levelling the surface smooth.

Manures and fertilizers: Good aeration and high fertility are necessary for vigorous root development and rapid growth early in the season which are conducive to large yields. Land should be enriched by applying farm-yard manure at the rate of 20 tons per acre and ploughed in while the land is being prepared for seed bed. Ammonium sulphate may be added at the rate of 2 maunds per acre when the fruits appear.

Method of sowing: Seed may either be sown broadcast or near the edges of raised beds with irrigated furrows in between. Water is supplied soon after sowing, followed by an other irrigation after about one week to facilitate germination. These plants do not require much moisture during the early stage, especially when the crop is sown broadcast after irrigating the land. The crop is usually weeded twice before the first irrigation.

When the soil is still moist after the first irrigation the crop is properly hoed. Irrigation is repeated weekly till the fruits are half grown ; watering is done sparingly afterwards. In all 5 to 6 irrigations are required.

Varieties

Musk melon: Hari Dheri, Lucknow Sweet, Faizabadi and Jaunpuri.

Long melon: Lucknow Tender Local.

Squash melon: Indian Squash.

Tinda

Sowing time and seed rate: Generally two crops are taken in the plains. For the early crop the seed is sown from the middle of February to the end of April, and for the late crop from the middle of June to the end of July. It is seldom grown in hills. Four to 5 lbs. of seed are sufficient to sow an acre.

Soil and its preparation: The soils best suited for tinda are sandy loam and silt loam which should be enriched with liberal application of farm-yard manure. Before preparation of seed bed the land should be ploughed 3-4 times.

Manures and fertilizers: Farm yard manure at the rate of 10 tons per acre should be added to the soil before preparation of

the seed bed. Ammonium sulphate at the rate of 1½ maunds per acre should be applied as top-dressing in two doses, firstly when the plants start trailing, and again when they start bearing fruit.

Method of sowing: The seed may be sown broadcast, or preferably the early crop may be sown on raised beds 4′-5′ wide with 2′ wide irrigation furrows in between the beds. Seeds are sown in hills near the edges on both sides of the bed. Three to four seeds should be planted about ¾″ deep. Irrigation should be given immediately after sowing. The second irrigation is given after a week or so. In dry weather the crop should be irrigated every 4-5 days. Inter-cultivation should be done to keep down the weeds. The crop sown on level ground should be irrigated once every 2 weeks with alternate tillage to produce much.

Varieties

Generally two types, one with light green, and the other with dark green colour of the rind are grown. The light green fruits are preferred.

Bitter Gourd

Sowing time and seed rate: In the hills the seed is sown from April to July and in plains from February to March. The second crop is sown in the plains from June to July. Four to five Lbs. of seed is sufficient to sow an acre.

Soil and its preparation: Sandy loam or silt loam soils are best for its production. The land should be well prepared by ploughing 3-4 times.

Manures and fertilizers: Farm yard manure should be applied at the rate of 20 tons per acre and ammonium sulphate at the rate of one maund per acre as a top-dressing at the time of fruiting.

Method of sowing: The crop should be sown on raised beds 3′-4′ broad with 1½′ wide irrigation furrows between the beds. The seeds are sown ½″to ¾″ deep in hills 3′ apart near the edges of both sides of the beds. Two plants should be left per hill when the plants are 2″-3″ tall. The early crop requires frequent irrigations in dry weather when the crop should be watered every 3rd or 4th day. The rainy season crop should be watered when necessary. Weeding should be done when required to keep the weeds under check.

Varieties

Early varieties: Small fruited.

Rainy season varieties: Long Fruited.

Bottle Gourd

Sowing time and seed rate. The first crop of *ghia kaddu* is sown in February and March, the 2nd in June-July, and the 3rd for early production during October-November. The vines of 3rd crop are protected from frost by *sarkanda* thatch erected over the rows of the plants. About 3-4 lbs. of seed are sufficient to plant an acre.

Soil and its preparation: Heavily manured loam soil is best suited to its production. The land should be thoroughly prepared by giving 4 to 5 ploughings before sowing.

Manures and fertilizers: The field should be manured at the rate of 15 to 20 tons of farm-yard manure per acre. The crop should also be given a top-dressing of 2-3 maunds of ammonium sulphate per acre firstly when the plants begin to trail and the second dose when they start bearing fruit.

Method of sowing: The bottle gourd should be grown on raised beds 5′-8′ wide with water channels 2′ between the beds. Seed should be sown on edges on both sides of the beds in hills 3′ apart. In each hill 3 to 4 seeds should be planted and 1-2 plants kept in a hill when they are well grown. Early crop requires frequent watering after every 4-5 days during the hot weather. The crop should be hoed well to keep the weeds under check until the vines cover up the land.

Varieties

Round Fruited (*Ghia Kaddu*).

Long Fruited (*Al Kaddu*).

Diseases

Damping off: The germinating and young seedlings in the nursery bed are generally attacked by this disease. The plants are attacked at or near the surface of the ground causing rotting or "damping off." The seedlings fall on one side since the portion attacked becomes too weak to support the plant.

Control: Too much watering of seed beds should be avoided. The soil of the bed should be sterilised with formalin solution, 1 in 50, or copper sulphate solution 1 Lb. to 25 gallons of water at the rate of 1 pint to each square foot of soil.

Bacterial Soft Rot: This disease is characterised by the soft decay of fleshy tissue of root vegetables like carrots, turnips and radishes. The tissues soften after infection and become watery or slimy.

Control: Drainage should be improved as the crops sown in low-lying areas are the first to suffer. Care should be taken to avoid injury to the roots of growing plants when thinning, hoeing and weeding.

Wilt of peas: In the crop sown early the tender plants wilt with stems drying up. This disease is favoured by high temperature especially in sandy soil areas.

Control: Late sowing and frequent irrigation of early sown crop will minimise the disease.

Mosaic of bhindi: The disease is caused by a virus and the diseased plants are distinguished by bright yellow colour of the veins. Leaves also show great curling and distortion and the affected plants are invariably dwarfed, and bear only malformed and pale fruits. This disease is spread by insect vectors such as white fly and jassids which breed and feed on *Bhindi*.

Control: All diseased plants should be destroyed and the insect vectors controlled by spraying with 0.05% D. D. T. solution (1 chhatak in 1½ maunds of water). Care should be taken to pluck all the fruits before spraying.

Insect Pests

Cabbage butterfly: The young caterpillars eat up the foliage, sometimes doing serious damage to cabbage, cauliflower and other cruciferous vegetables.

Control: Egg clusters and caterpillars from the infested leaves should be collected and destroyed. Spraying with D. D. T. (W P) 0.1% solution gives very good results; 2 to 3 Lbs. of the insecticide will be required to spray an acre.

Aphids: This pest attacks brassica and vine crops. The nymphs that are tiny, green, winglet insects suck the sap from the plant tissue and consequently the leaves and tender shoots ultimately wilt. The foliage becomes spotted with sticky deposit excreted by the pest and finally if the attack is very serious the plants die. The aphids also spread virus disease and prove very harmful.

Control: Spraying the crop with Tobacco Decoction controls the pest. The mixture is made up as follows:

Tobacco refuse	1 seer
Soap	4 chh.
Water	10 seers.

The tobacco refuse is soaked in full quantity of water for 24 hours or boiled for two hours and strained. Soap cut in thin pieces is added to the strained extract and stirred vigorously to dissolve. This stock solution is diluted 4 to 5 times with water before spraying.

Epilachna beetle: ("Hadda") The pest attacks brinjals, potatoes and other solanaceous crops and some cucurbits. The 'hadda' grubs are hairy, light yellow in colour. They feed on the lower side of the leaves leaving the upper epidermal tissue intact. The adult beetles are dome-shapped and measure about quarter of an inch in length. In colour they vary from bronze to deep red, and have 6 to 14 black dots on forewings.

Control: Spraying the crop frequently with 5% D. D. T. controls the pest. 1 to 2 Lbs. of the insecticide is sufficient to spray an acre.

Red pumpkin beetle: This insect feeds on the young cucurbits and is very destructive. The upper surface of its body is orange red in colour and the lower surface entirely black.

Control: Early sowing should be done in order that the plants are well grown before the pest multiplies in great number. Dusting with B. H. C. 5% is very effective. Four to five lbs. of insecticide mixed with some quantity of ash is sufficient for one acre.

Vegetable mite: It is a very serious pest of 'Tinda', eggplant and 'bhindi'. It is extremely small in size and varies in colour from greyish green to brown. It damages the plant by sucking its sap as

well as by profuse webbing which ultimately results in falling of leaves.

Control: Dusting with lime sulphur mixture 5:1 controls it completely.

Onion thrips: The thrips are very minute, slender-bodied, whitish sucking insects which attach the leaves of onion and garlic plants giving them a blanched or blighted appearance. The leaves become curled and deformed and the outer leaves get browned at the tips.

Control: Thorough dusting with B.H.C. 5% controls the insect. The dusting should be done at week's intervals.

CHAPTER 24

FODDER (Berseem)

Berseem or Egyptian Clover originally introduced from Egypt has adapted itself remarkably to the Punjab conditions and has proved to be an ideal forage crop on irrigated tracts. It has become very popular with the cultivators and can easily be called king of fodder crops in northern India. The variety "Mesjawi" has given the best results under Punjab conditions, and is grown extensively in the State. Like other leguminous crops, berseem enriches the soil and improves its fertility. The crops grown on soil where berseem has been grown give higher yields. Because of its succulent nature, it is highly relished by all kinds of livestock, and is specially suited to milch cattle, as it improves the milk yield. The fodder is rich in protein. It is a heavy yielder and is capable of producing large quantities of green fodder in 4 to 5 cuttings from the middle of November onwards upto May. On comparative basis, it is found that it gives three times the yield obtained from "Senji." On an average, it gives between 500-600 maunds of green fodder per acre, but on rich soils, the yield may be as high as 1,000 maunds per acre. Both from the point of view of quality and quantity of fodder, it is superior to Senji and most other rabi fodders, which it is replacing fairly rapidly. It can replace 'Senji' in the ordinary rotation of crops except that sugarcane cannot be grown after it, because it occupies the field for a longer period than Senji. It can be successfully grown year after year in the same land but, usually, it follows cotton and maize. November-December and April-May are the two periods in the year when the cultivator faces scarcity of green fodder. Since berseem gives 4 to 5 cuttings upto the end of May, it has helped considerably to tide over these periods of scarcity.

Soil

Berseem fares well in most of the soils provided they are retentive of moisture. Rich loam soil is, however, the best. Poor sandy soils are not suited to it. It is advisable to apply farmyard manure at the rate of 15-20 cart-loads per acre to poor soils if berseem is to be grown on them. Phosphatic manure at the rate of 30-50 pounds of P_2O_5 per acre

has also been observed to enhance the quality and quantity of this forage. The soil should be thoroughly ploughed and levelled, and should be free from weeds. A fine seed-bed gives the best results.

Sowing and Seed-rate

The sowing of berseem in the plains usually commences from the middle of September and continues upto the middle of November. In hotter parts of the State, sowing may be delayed upto the end of November, as in the case of earlier sowings the tender seedlings are killed by the intense heat. In sub-montane areas, it may be sown about a fortnight earlier. '*Kashni*' or chicory is often found mixed with berseem seed, which can be easily separated by soaking the seed in 5% salt solution. The seed which will float on the surface should be discarded. The good seed remains at the bottom of the container. The best method of sowing is to broadcast it in standing water. When the seed bed is ready, it should be irrigated and the seed broadcast. It can also be sown on dry prepared seed bed, lightly harrowed and irrigated immediately after the seed is broadcast. There is another method of sowing, according to which the seed may be soaked in water for 10 to 12 hours and then broadcast on a moist seed bed. The field is planked with the help of Sohaga after the seed is lightly harrowed. According to this method, the first irrigation can be delayed by a few days. 8-10 seers of seed is sufficient for sowing one acre of land. Sometimes, *senji*, oats, or rape (sarson) are mixed with the seed to increase the yield of the first cutting. Care should, however, be exercised in selecting the seed. The seed should be of bright yellow colour and free from '*Kashni*' and other weed seeds. The seed with an admixture of brown seeds gives poor germination.

Berseem is capable of fixing nitrogen in the soil from the air with the help of a particular type of bacteria which form nodules on its roots. In the absence of this organism in the soil, plants remain stunted and sickly, resulting in low yield and poor quality of fodder. In order to remove this handicap it is desirable to inoculate the soil with the required bacteria. This is essential particularly in cases where berseem is to be grown for the first time. The inoculation can be done either by broadcasting 2-4 maunds of soil from a field where berseem has already been grown or by adding special cultures prepared for this purpose. In the former case, it should be seen that the

soil is taken after removing the upper 3 inches layer of dry earth from the field. In the latter case, special cultures of berseem organism are available with the District Agricultural Staff. One full size tin costing about Rs. 1/2/- suffices for one acre of land. The culture should be mixed with about half a seer of 10% gur solution and the liquid then sprinkled over berseem seed, heaped on a gunny bag or clean floor, and mixed with it thoroughly. The seed should be dried in a thin layer in shade. The treated seed should not be kept for more than 24 hours before sowing, as drying lowers the viability of the bacteria which may ultimately be killed if seed is not sown for an unduly long period. The sun is also very harmful to them and the treated seed should, therefore, be sown either in the evening or on a cloudy day. The seed should be sown alone mixed with equal quantity of fine soil in standing water in the evening. The inoculated seed is expected to yield 86 per cent more fodder than the uninoculated one. The field where berseem has been grown previously needs no inoculation. The first irrigation may be given about a week after sowing to ensure satisfactory germination and to give the crop a good start. Thereafter, irrigation may be given whenever required. The field, however, should not be allowed to get too dry in between the irrigations and an interval of a fortnight may be considered sufficient. During winter, the interval may be prolonged, while in April-May, it may be reduced. In all, 16-20 irrigations are required to produce a successful crop. Frequent irrigations are given to the crop reserved for seed during the flowering and seeding stages. The crop stops growth from about the end of April or middle of May in the plains. In cooler regions in the hills, the growing period is long and may extend to the end of June.

Time of Cutting

The first cutting can be obtained in about 50-60 days after sowing, when it is 1 foot to 1½ feet high. At this, stage, plants have generally single shoot, and forage yield is low. Later on, plants tiller profusely and enable subsequent cuttings at an interval of about 30 days.

Seed Production

When the seed is to be produced, the cutting of crop is stopped from about the middle of February at places where the hot season starts early in April, and by about the middle of March where the hot season starts by about the end of April. By about this time, three cuttings are generally taken,

and blossoms appear on the plants. During the blossoming period, the crop reserved for seed should be irrigated frequently at intervals of 7-10 days and the '*kashni*' and other weeds should be removed from the plot, in order to get pure seed. The seed ripens in May when the crop should be cut and thrashed with the help of bullocks. Under favourable conditions, the crop can yield seed upto 8-10 maunds per acre, but, usually, the out-turn is not more than 2-3 maunds per acre.

IX
HORTICULTURE

CHAPTER 25

HORTICULTURE

Most of the fruit gardens, planted on modern lines were left in West Punjab. There was thus urgent need for fostering horticulture in the State. The scheme of Cooperative Garden Colonies was formulated for this purpose. This scheme is in operation in 11 out of 13 districts of the Punjab.

To evolve better varieties of different fruits, suited to Punjab conditions, experimental fruit gardens have been established at various places. The varietal, manurial, and cultural experiments are in progress in these.

To cater for the needs of fruit plants, Government nurseries are established at different places in the State, *viz.*, at Jullundur, Gurdaspur, Attari, Hansi, Karnal, Sirsa, Abohar and Panipat. From these nurseries reliable, pedigreed and disease-free fruit plants of selected varieties can be obtained.

Short courses in fruit and vegetable preservation are held free of cost for interested persons. This training has become very popular among women and girl students.

For imparting advice on gardening, the Agriculture Department maintains a staff of Horticultural Inspectors who are stationed at Gurdaspur, Jullundur, Moga, Panipat, and Rohtak.

Site

Fruit growing is a long-term investment. Careful planning of the garden is very essential. Mistakes cause a net economic loss to the grower, and cannot be rectified easily in later stages. Some of the points which should be considered when planting a garden are dealt with below. Great care should be exercised in selecting the site for an orchard and the following points should be taken into consideration :

(a) A careful study of the place should be made before planting the garden. Areas where fruits are not being grown or have not been tried, or where their cultivation has been discontinued are open to considerable risk.

(b) The site should preferably be in a section where fruits are already grown for this would be helpful in the sale of produce.

(c) The garden should be near a good metalled road or railway station to facilitate transport of fruit to markets. A post-office within easy reach is always an additional advantage.

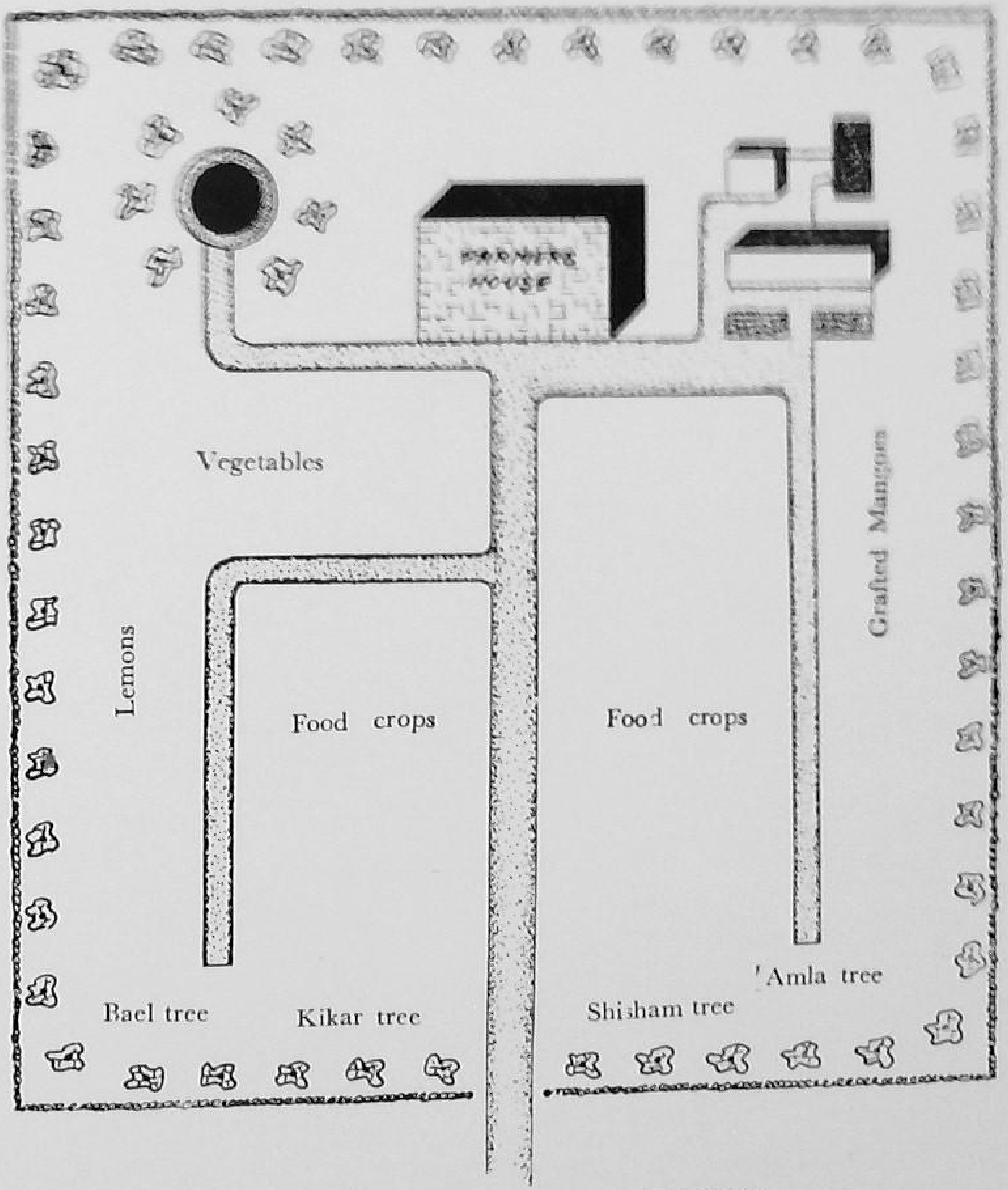
(d) Good irrigation facilities are essential for successful production of fruits.

Climate and Soil

According to climatic requirements, fruits can be divided into two classes: (1) those which can be grown under temperate conditions, such as apples, pears, peaches, plums, persimmons and apricots ; and (2) those which can be grown under tropical conditions, such as, citrus fruits, mangoes, loquats, dates, guavas, figs, bananas, papayas, pomegranates, *ber*, etc. Fruits in the first category can be grown successfully in hills, particularly, in Kulu, and Outer Seraj of Kangra district. Fruits mentioned in the second category are generally grown in the plains.

Since roots of fruit trees go deep in the soil, the nature and character of sub-soil are of special importance and must be examined before the trees are planted. This can be done by digging holes at random at different places of the field to a depth of 6-8 ft. Sub-soils with lot of gravel, coarse sand, hard pan of clay or other impervious and alkaline strata are unsuitable for fruit gardening. Swampy and water-logged soils should also be avoided. Water table within 6-10 ft. range of root growth, especially if it varies in depth according to season, is also undesirable. The soil requirements of various kinds of fruit trees are generally as follows:

Kind of fruit	*Soil requirements*
Mangoes	Deep, well-drained, loamy soil retentive of moisture.
Citrus fruits	Well-drained sandy loam with good amount of organic matter.
Pears	Can grow on a variety of soils but usually clay loams are preferred.



A MODEL TREE PLANTATION PLAN, FOR A SMALL FARM

Kind of fruit	*Soil requirements*
Loquats	Good well-drained light loamy soil.
Apples	Deep, rich, well-drained calcareous loamy soil.
Peaches	Varying with stock used for budding. Peach stock would do well on light warm sandy loam soils, while plum stock may thrive on heavy and moist soil.
Guavas	Deep sandy loam.
Grapes	Sandy loam soil, not retentive of too much moisture.
Pomegranates	Deep calcareous soils.
Dates	Sandy to thick clay. Can stand considerable accumulation of alkali in the soil.
Papayas	Sandy loam to loam.

Preparation of Land

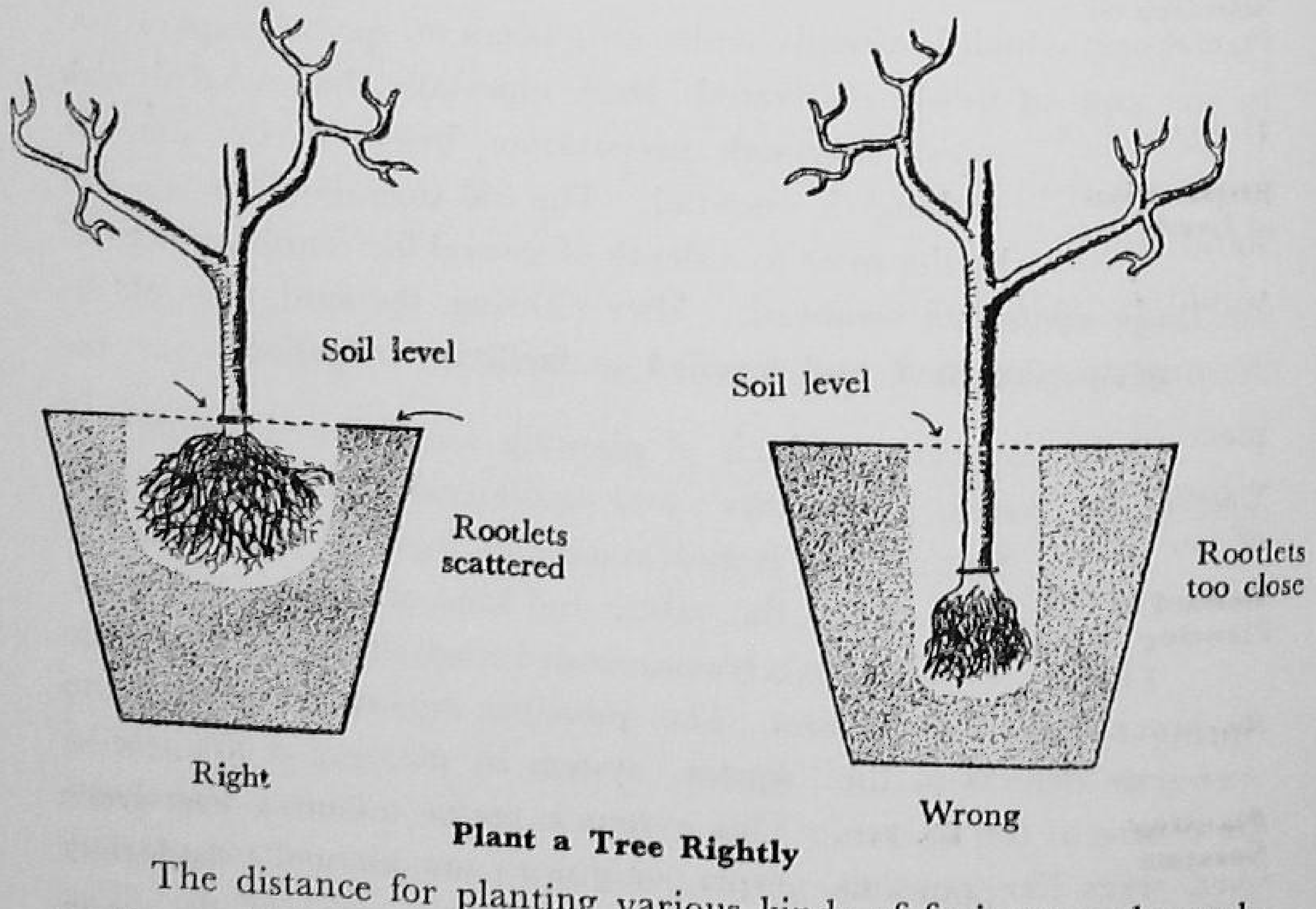
Land which is already under crop needs no special preparation. In the case of newly cultivated land, especially that wooded with trees, thorough preparation before laying out the orchard is essential. The old trees should be dug out by the roots to a depth of several feet ensuring that all the large roots are removed. After clearing the land, it should be thoroughly ploughed and levelled to facilitate irrigation.

Method of Planting

Three common methods of planting are followed: square or rectangular system ; quincunx ; and equilateral or hexagonal. The first method is most commonly used, though the choice depends on the nature and kind of fruits to be grown. This system is recommended when the distance between the trees is 20 feet or less. The quincunx lay-out is designed to overcome defects in the "square" system by planting a fifth tree in the centre of the square. This system is useful in cases where short-lived trees like peaches, grapes, or guavas are planted temporarily (as fillers) among the trees occupying the field permanently. The fillers, of course, should be removed as soon as they are found to be interfering with the growth of permanent trees. In the equilateral or hexagonal system, the trees are equidistant from each other in every direction, and about 15 per cent more trees are planted on the same plot than under the "square" system.

The following table shows the number of trees that can be planted per acre at various distances under the "square" and "hexagonal" systems:

Distance between rows of trees (in ft.)	System of planting & No. of trees per acre	
	Square system (Trees)	Hexagonal system (Trees)
10	435	500
12	302	347
15	193	222
18	134	154
20	109	125
22	90	103
25	69	80
30	48	54
35	35	40
40	27	31



Plant a Tree Rightly

Distance of Planting

The distance for planting various kinds of fruit trees depends on the available moisture supply and growing habits of particular species or varieties. The stocks on which different kinds of fruits are budded also play an important part. The following distances would serve as a rough guide to the fruit growers:

Kind of fruit	*Distance in feet*
Apple, apricot and cherry	20 to 25
Banana, grape and papaya	10
Malta	18 to 20
Sangtra, pear, guava, sweet lemon, lime and plums	20 to 25
Dates	15 to 20
Jaman, ber seedlings	30 to 35
Mango seedling, figs and walnuts	35 to 40
Mango grafted	30
Pomegranate	15
Lichi and loquats	25
Peach	20
Mulberry	25 to 30

Selection of Plants

The selection of the right type of plants and the right varieties is the foundation of successful gardening. The high yielding varieties of known parentage which have proved a success under local conditions and for which there is a demand in the market should be selected for planting. If there is no local or near-by market, it may not be desirable to grow soft fruits like loquats, peaches and straw-berry, which cannot stand shipment over long distances. Citrus fruits, apples and pears would do well under such circumstances.

Plants should be purchased from a reliable nursery near the place of planting, to avoid damage in transit. The plants should be vigorous, well-shaped and uniform in size. Medium-sized plants of one year age, budded or grafted, at about a height of 12 inches from ground level are considered the best.

Planting Seasons

There are two distinct seasons of planting in the State: (1) Spring—From the end of January to the middle of March, and (2) Monsoon—Middle of July to the end of September. The latter season is suitable for planting ever-green plants like citrus fruits and mangoes, while the former is considered the best for planting both evergreen and deciduous fruit trees (peaches, plums, apples, apricots, cherries, pears and grapes) which shed their leaves in winter. There is less mortality among plants planted in the spring as compared to August and September plantings.

After laying out the orchard, round pits with 3 feet diameter should be dug at proper places. The size of the pits would, however, depend upon the nature of the soil, the rule being that harder the soil, the bigger the pit. They should be allowed to remain open for a week or ten days and then filled with silt and well-decayed farm-yard manure with which the top foot soil taken out of the pit should be mixed. A crown of 4 inches above the soil surface should be allowed. Soon after filling, the field should be irrigated. The plants should be set in with the help of a planting-board after the soil is in a workable condition. It is important to set the plants at precisely the same height as they were in the nursery. The soil round the plants must always be well-pressed so as to enable the plant to come in firm contact with the soil. After the trees are set, these should be irrigated. If the plants have not already been headed back to a height of 18-24 inches by the nurseryman from whom the plants have been purchased, it should be done immediately after the plants have been set in the field. Citrus fruit plants require comparatively less heading back. The grafted mango plants raised in pots require no heading back, the planting being done without disturbing the root system. In the case of mangoes, the budding in 'situ' may be followed with advantage to avoid risks of damage to plants in transit and also after planting in the field.

For the first one or two years it is desirable to protect the ever-green fruit trees like mangoes, citrus, lichis, etc. from sun-burn and frost. White-washing the trunks is a good device to save the plants from sun. 40 pounds of slack lime in about 12 gallons of hot water, diluted if necessary with cold water, to secure easy flow, would make ideal paint. For protection against frost, temporary thatching may be erected around the plants from the ground to a foot or two above the head.

Varieties Recommended for Planting

Varieties of important fruits which are recommended for planting are given below:

(1) Malta Orange

Blood red, Pineapple, Excellencies, Vaniella, Musambi, Seville, Valencia late, Dulcis, Jaffa.

(2) Grape-fruit

Marsh's seedless, Foster and Duncan.

(3) Mangoes

Langra and Dusehri.

(4) Apples

Cox's Orange Pippin, Newton Pippin, American Mother Blenheim Orange, Red Delicious, Baldwin, Golden Delicious, Stamford Pipping, Autumn King Pippin and Granny Smith.

(5) Pears

Williams.

(6) Dates

Hillawi and Khudrawi.

(7) Lemons

Eureka and Villa Franca

Irrigation

The number of irrigations would depend upon the amount of rainfall, type of soil, other climatic conditions, and the age and kind of fruit trees. Generally speaking, deciduous fruits require about 30 inches of rainfall or irrigation. The citrus fruit trees being ever-green require larger amount of water—35-40 inches. Since the rainfall in the plains of the Punjab is comparatively low, artificial irrigation is essential for the successful growth of fruit trees. In the sub-montane districts, the trees require less irrigation than in other districts. After the plants are set and first irrigation given, basins about 2 feet wide and 3 inches deep at the exterior boundary with an upward slope towards the trunk should be made around the plants to facilitate irrigation. These basins will be about 4 feet in diameter. The basins may be connected by a subsidiary water channel running in between the rows of trees. The second irrigation may preferably be given a day or two after the first one, and thereafter at an interval of a week or ten days, in summer and every 2-3 weeks in winter. The size of basins is increased with the increase and spread of the trees. This system of irrigation may be adopted in the first 4 to 5 years but later on, the "flood" system may be followed, as the feeding root zone extends far away from the base of the trees.

Manuring

For the proper growth and production of fruits, the fruit trees must be supplied with adequate plant food. Often it has been noticed that orchards become unprofitable after reaching the age of 10 to 15 years for want of adequate nourishment. In order to avoid this, the fertility of soil should be maintained by application of farmyard manure and artificial fertilizers. In actual practice, the necessity for the application of manure and fertilizers will not be felt till after the first year of planting.

CHAPTER 26

GARDEN COLONIES

Cooperative garden colonies were started in the Punjab under the rural rehabilitation scheme. These have received great impetus under the community development programme as funds are now being provided for sinking of tubewells and purchase of plants.

Twenty seven large blocks of evacuee land which had been excluded from general allotment have been allotted to persons interested in horticulture for growing gardens. As a result of this the East Punjab will add some 20,000 acres to its area under gardens. These colonies have been established in 11 out of 13 districts of the State on fertile blocks of evacuee land on the roadside. A few of the colonies are situated close to the towns of Jullundur, Muktsar, Patti and Hansi. Others are also quite favourably situated on *pucca* or *kacha* roads. Their areas vary from 195 acres of Allowal Dalamwal in Hoshiarpur district to 2066 acres of Jundla in Karnal. Each allottee has been given either a unit of 20 acres, or half a unit of 10 acres. The total number of allottees in all the 27 garden colonies is 1122.

Allotments in the Garden Colonies have been made in lieu of the area allotable under the quasi-permanent allotment scheme and is not an additional allotment of land. Those who have received allotments in Garden Colonies have had this area deducted from the total area due to them. If, after deducting the area for unit or half unit in a garden colony, the remaining area was less than five standard acres the allottee received this area also within the garden colony. If, however, the balance exceeded five standard acres it was given to him elsewhere. It was also decided to harness the enthusiasm and talent for gardening in the non-displaced people of East Punjab by allotting them similar areas in the garden colonies. The condition for their admission into these colonies was that an allottee had to surrender an equivalent area from his holding which was added to the general evacuee pool. Before any area from an East Punjab

Oranges are popular in Punjab

Citrus plantation in a garden colony

resident was, however, accepted it was inspected by an officer of the Revenue Department as well as the district Agricultural Officer in order to ascertain that it was not inferior to the area that he was getting in the garden colony. An upper limit of 20% was fixed as the share of East Punjab residents but actually they have received only 6% area on account of greater demand from displaced land-holders.

Value of Fruit in Diet

What was the need of establishing so many garden colonies? With so much emphasis on the production of cereals the necessity of fruit culture has been questioned in quarters who have little knowledge of the science of dietetics. The value of protective foods in human diet has been only recently recognised. Protective foods are rich in vitamins and minerals and protect the human body against deficiency diseases. Among the protective foods are fruits along with vegetables, milk and eggs. A monotonous diet of cereals and pulses dulls a person's faculties and explains low intelligence and lack of energy in communities which do not make sufficient use of protective foods. "The people of Hunza," says Major General R. McCarrison, "make less use of meat than either the Sikhs or the Pathans. Their food is much the same as that of Sikhs but less rich in milk, their stock being confined to goats. They are, however, great fruit-eaters, especially of apricots and mulberries. They use apricot and mulberries in both the fresh and dry state, drying sufficient of their rich harvest of them for use throughout the autumn and winter months. Dried mulberries are mixed with the wholemeal flour and made into cakes which form their staple articles of diet. Meat is a luxury used only on special occasions. These people are unsurpassed by any Indian race physique ; they are long lived, vigorous in youth and age, capable of great endurance and enjoy remarkable freedom from disease in general." It is clear from what these authorities say that more fruit people eat, the greater is their capacity for work and enjoyment of health and happiness.

Minimum requirement of fruit per individual has been calculated at two ounces per day. As compared with the requirements the consumption is far less, as production of fruit in India is very low, and on account of partition it has fallen down still more. In West Punjab fruit culture received a great impetus on account of zealous

work of the Fruit Specialist S. Lal Singh, who on his return from U.S.A. spared no effort to raise orchards of oranges on the model of California in the canal colonies. As a result of the partition East Punjab became deficit in citrus fruit. Flourishing citrus orchards were left on the other side of the border and the gardens that fell on this side were mostly old and had passed fruit bearing stage in many cases and were usually small and uneconomic.

Although East Punjab is a small State, she is lucky in having a variety of climates ranging from Alpine, Temperate to hot and arid.

Climate of Punjab

The climate of the Punjab plains is determined by their distance from the sea and the existence of formidable mountain barriers in the north and west. The factor of elevation makes the climate of the Himalayan tracts very different from that of plains. Still more striking is the contrast between the Indian Himalayan climate and the Central Asian Trans-Himalayan climate of Spiti, and Lahaul. The winter or north-east monsoon does not penetrate into the East Punjab, where light westerly and northerly winds prevail during the cold season. What rain is received is due to land storms originating beyond the western frontier. The branch of the summer or south-west monsoon which affects the East Punjab chiefly is that which blows up from the Bay of Bengal. The rain clouds striking the Eastern Himalaya are deflected to the west and forced up the Gangetic plains by south-easterly winds. The lower ranges of the Punjab Himalayas receive in this way very heavy downpours. The rain extends into the plains, but exhausts itself and dies away pretty rapidly to the south and west. The Bombay branch of the monsoon mostly spends itself on the Ghats and in the Deccan. But a part of it penetrates from time to time to the south-east Punjab, and, if it is sucked into the Bay current, the result is widespread rain. The East Punjab is subject to extremes of cold and heat. During winter the disturbances from the west which pass across are as a rule preceded by a rapid rise of temperature and succeeded by a large fall, and from time to time temperatures several degrees below freezing point are recorded even in the plains. In summer, which lasts from April to the end of June, hot dry winds prevail in the afternoon and in May and June temperatures from 110 to 120 degrees are recorded. The intensity of heat is relieved at intervals by the occurrence of a series of dust storms and thunderstorms which are sometimes accompanied

with rain. During the monsoon season the heat, although comparatively mild on rainy days, is still intense during the breaks in the rains. It begins to moderate about the middle of September and from the beginning of October though the days are still hot, the nights are fairly cool. The months of October and November and the greater part of December, during which weather is generally dry and temperature is falling rapidly, form in fact the most pleasant part of the year in the East Punjab. Within the hills the seasons and their changes are similar, though of course the heat is much more moderate and cold considerably more severe.

Rainfall Distribution

District	Monsoon June to Sept.	Winter Dec. to March	Annual
	Inches	Inches	Inches
Hissar	12.21	1.87	15.26
Rohtak	16.80	2.07	19.76
Gurgaon	18.89	1.85	22.08
Karnal	18.44	2.74	22.67
Ambala	27.87	4.35	34.24
Karnal	47.11	9.14	59.37
Hoshiarpur	24.26	5.33	31.48
Jullundur	19.56	4.12	25.37
Ludhiana	19.48	3.55	24.73
Ferozepore	11.22	2.24	14.56
Amritsar	16.35	3.85	21.77
Gurdaspur	26.94	6.70	35.80
Simla	29.78	9.72	45.96

Temperature

Station	Mean Maximum temperature		Mean Maximum temperature		Record temperature			
	May	June	Dec.	Jan.	Highest	Month	Lowest	Month
Simla	72.1	73.1	39.3	35.9	94.4	May	17.1	February
Hissar	106.5	106.8	42.8	42.7	121.1	May	29.0	January
Ambala	103.7	102.7	43.1	43.3	117.6	May	30.7	February
Ludhiana	103.9	104.7	44.4	44.4	119.0	May	24.0	December

According to climate East Punjab can be divided into four zones:

(*i*) The Himalayan zone comprising the districts of Kangra and Simla, with cool temperate climate.

(*ii*) The Sub-montane comprising the districts of Ambala, Hoshiarpur and Gurdaspur.

(*iii*) The Central Zone comprising the central districts of Amritsar, Jullundur and Ludhiana with a moderate climate.

(*iv*) The Arid Zone comprising the districts of Ferozepur, Hissar and Gurgaon.

In the extreme north are Kulu and Simla with cool temperate climate so suitable for apples and persimmon. Palampur tehsil of Kangra district with the 16,000 feet snowy range of Dhaula Dhar giving birth to numerous fresh water streams which traverse the tilted plain of the valley is suitable for tea-cultivation and for some varieties of peach and plum.

Below the Himalayas are the districts of the Siwalik range—Ambala, Hoshiarpur and Gurdaspur. The sub-montane tehsils of these districts enjoy a moderate climate with a rainfall of 30 to 40 inches. Frosts are also experienced in winter and in summer it does not become uncomfortably hot as in other parts of North India. The Rupar and Kharar tehsils of Ambala district and the entire area in Hoshiarpur and Gurdaspur districts is fertile agricultural tract well-covered with trees, particularly mangoes and *shisham*, and has been rightly named as the garden land of the East Punjab. The districts of Ambala and Hoshiarpur are drained by a number of *Chos*, monsoon torrential streams, whose fury has been curbed in Hoshiarpur district by intensive soil conservation measures taken by the Forest Department. Soil in Gurdaspur district is more fertile as compared with the sister districts of the sub-montane area. On account of absence of natural drainage in the form of *chos*, in the years of heavy rainfall, the Gurdaspur plain is liable to floods. These three districts of the submontane area are suitable for the growth of mangoes and citrus, particularly *Santra* orange. In Pathankot tehsil of district Gurdaspur even blood-red oranges and *litchis* are successfully grown. The garden colonies of Adhoi Tolanwali

and Khanpur in Ambala and Dalamwal in Hoshiarpur are particularly suitable for the growth of grafted mangoes like the *Dusehri*, *Langra* and *Sufaida*. The garden colonies of Dyalgarh and Khojepur in Gurdaspur which are situated on the Amritsar-Pathankot road are particularly suitable for grafted mangoes, litchis, *santra*, peaches, plums and pears.

Of the central districts, Amritsar is the most fertile and also enjoys the advantage of canal irrigation. The garden colony of Khankot is close to the city of Amritsar on the Grand Trunk road and apart from the facility of canal irrigation, it can also be easily electrified and can have tube-well irrigation. This colony is suitable for the growth of pears and banana. Patti garden colony in this district has a fertile soil and has the additional advantage of plentiful supply of canal water, and for cultivation of *Malta* oranges it will be a most successful colony in East Punjab. The garden colony of Kingra-Boot is close to Jullundur town and a number of tube-wells have been sunk. The soil is suitable for *Santra* and *Malta* oranges and on account of nearness to the town it will be particularly suitable for market gardening and dairying. The same would apply to Jogiana-Kanganwal and Khanna colonies in Ludhiana district.

The soil and climatic conditions in the garden colonies of Ferozepur and Hissar are similar to those of Lyallpur and Montgomery. Rainfall is scanty but the soil is a fertile tract of rich alluvium. With the extension of canal irrigation the garden colonies in these districts would become the main centres for supplying citrus fruit to East Punjab and Delhi.

We have seen that there is enormous scope for the development of fruit industry in East Punjab. According to the Fruit Specialist of the East Punjab Government the area under citrus can easily be trebled. Although a vast majority of the gardens on this side are mango gardens, still Punjab (I) imports mangoes. Apart from favourable climate, and large unsatisfied demand for fruit, the authors of the scheme had also in mind the large incomes that the gardens gave, particularly in canal colonies. Instances were not uncommon when fruit crops had given net income of Rs. 2000/- per acre in case of well managed orchards. On an average income from Rs. 500/- to Rs. 1000/- per acre may be expected from an orchard.

We have seen that there are fewer and inferior gardens in the districts which formed the East Punjab than there were in the districts which comprised the Pakistan Punjab. There are two reasons for this. One is that the holdings on the Indian side of the border are small and scattered. The other is the lack of irrigation. These two draw-backs could only be overcome through a State-sponsored scheme of gardening which could give the growers compact holdings and enhanced and assured supply of water. In the canal colonies in West Punjab the holdings were large and compact and water supply from the canals was abundant. The scheme of Garden Colonies is an effective solution of the handicaps under which horticulture in East Punjab was suffering as compared to West Punjab. In fact it is a little more than that. If the growers are concentrated at specific places, they get more money out of their gardens. The principle is that the larger the garden, the greater the income per acre. Fruit growing is a branch of agriculture which is particularly amenable to mass scale methods. The per acre cost on such items as supervision, production of nursery plants, control of pests and diseases etc. is appreciately reduced if there are large areas under a single fruit crop at one place. It is also possible to organize marketing on proper lines, to attract customers, to start subsidiary industries such as cold storage and fruit preservation and thus to derive the maximum returns from the fruit orchards. The advantages accruing from large scale gardening are also available if we have concentrations of gardens although owned by different individuals. The existence of extensive blocks of evacuee land made these concentrations possible. The demand for large and compact blocks of good land for garden colonies was easily met because such blocks were available in large number of evacuee villages. The other obstacle in the way of successful gardening, the absence of a constant and certain supply of water, has been only partially overcome. Fifteen out of 27 colonies get canal water. Although the amount of water that they are getting at present is not sufficient, Government can attend to their demand much better than it could if it came from persons having scattered gardens. Under the existing rules for supply of canal water to fruit trees, four colonies, *i.e.*, Bir Akhara in Ludhiana, Patti in Amritsar and Kharkhauda and Lahli in Rohtak can be supplied with water for all the area which is to be planted under fruit trees. The other colonies will also get additional

Irrigation

supplies of water by and by when new rules are framed by the Irrigation Department, and more water is available in the canal.

For the remaining colonies which are dependent on sub-soil water for irrigation purposes and also for three of the canal irrigated colonies which were not getting sufficient water, the Government have advanced a loan of Rs. 7½ lakhs for sinking tube-wells. Twenty five thousand rupees have been given for one tube-well each. Tube-wells are being sunk in the following colonies: Dyalgarh, Jalalabad, Boot Kingra, Mahalon, Alowal, Panam, Rahon, Jugiana-Kanganwal, Adhoi Tolanwali, Morinda, Khanpur, Kachrauli, Jundla and Lahli.

Selection of Garden Colonists

The garden colonists are generally educated persons who have experience of gardening, and have been carefully selected. Some 6000 applications were received for allotment in these colonies. A preliminary selection from among these was made by two members of the Agriculture Department according to the percentage laid down for different categories of displaced applicants, *e.g.*, large fruit growers, small fruit growers, graduates of Agricultural Colleges, graduate grantees, landholders without gardens, servicemen and ex-servicemen, public workers etc. The final selection was made by a committee consisting of ministers, public men and officers of the Agricultural and Rehabilitation departments. Vacancies occurring later were filled up by Director General Rehabilitation subject to the approval of this Committee.

Consolidation of Land

Although the areas selected for garden colonies were in fairly compact blocks, they were not exclusively evacuee blocks but were interspersed with pieces of non-evacuee area which naturally could not form part of these colonies. These pieces were, therefore, removed to one side of the colony by a process of consolidation.

The islands of non-evacuee areas have been absorbed in the colonies and their owners have been given evacuee land of equivalent value on the fringes of the colonies. This operation was followed by *killabandi*, which means demarcation of one acre plots or *killas*, as they are called, on the ground. Fields with irregular boundaries are unsuitable for mechanized cultivation and horticulture and

through *killabandi* one acre plots were demarcated and out of these *killas*, squares or rectangles were formed. This work was done by the Consolidation of Holdings Department of the State.

Demarcation of Lay-outs

The area reserved for these colonies having assumed a compact shape, roads, residential areas, sites for public buildings, nurseries etc., were demarcated on them by the Town Planning Staff of the Public Works Department of the State with the assistance and advice of the Managing Committees of the Colonies. The roads were laid out in such a way that each plot had access to a road. The width of the main roads has been fixed at 27½ feet and that of the cross roads at 22 feet. Diagonal roads cutting through plots and fields have been avoided. Area has also been reserved for a common residential site for the allottees on the scales varying from 4 kanals to 6 kanals per allottee. In Jullundur, Mahalon, Kachruali, Dyalgarh, Khajoorke and Bahauddin colonies the existing village sites were large enough for the allottees to build their houses on and hence areas from agricultural land have not been reserved for residential purposes. For common buildings like office hall, market, shops, dispensary, library and school, areas varying from 2 to 4 acres have been reserved close to the residential sites. These sites will be town-planned before the building work starts. A two feet and a half strip running along the boundary line has also been left out for fencing. Trees will be planted along the roads and the boundary line.

Allotment of Plots

After the colonies had thus been laid out, allotment of plots *i.e.*, the partition of the colony among the individual allottees was taken up. Before the plots could be distributed among the allottees, these were demarcated on the ground. Theoretically each allottee of one unit was entitled to a plot of 20 acres and each allottee of half a unit was entitled to a plot of 10 acres. But in each colony some land has been taken up for nurseries, residential site, common buildings and fencing. This reduced the size of the plots by some two acres. The problem was how to partition the remaining area among the allottees in a fair manner. All the area of a colony was not of uniform quality. Several factors influence the income from land and those factors may be present in different fields in variable quantities. Some fields may have soil of superior quality, others may be nearer a national or State

highway or may be adjacent to a canal outlet or a well. Others may not be so favourably situated. Still others may be sandy, may be infested with salts or waterlogged or may have pits, depressions or mounds in them. Fullest consideration had to be given to all these factors. There were two ways of assuring fair treatment to everybody and minimising the risk of poor allotments to some allottees. One was that if inferior area lay on one side of the colony it should be separated and distributed proportionately among all the allottees so that each allottee gets a portion of the inferior and a portion of the superior area. This was not, however, very happy solution since it is inconvenient to have a holding in two separate plots.

The other method was that everybody should get his allotment in one consolidated place but the size of the plot should be varied to counterbalance superiority or inferiority of the fields. Thus those who get some inferior fields should get larger plots than others who get all good land. For this purpose each *killa* or an acre plot was valued in terms of annas, better *killas* getting more value and inferior *killas* getting less. Since the value of each allottee's holding in terms of rupees and annas had to be equal, the allottees of inferior fields naturally get more of them. The inferiority in quality of soil was thus made up by area. These fields had been valued even before for the purpose of general allotment but that valuation was too broad-based as it was based on assessment circles and percentage of irrigated area in large chunks was taken into consideration. It took no account of individual fields, having the same source of water supply and situated in the same assessment circle. A more detailed valuation was, therefore, necessary. In all the colonies except four the single plot method has been followed and allottees have received their entire area at one place. The four colonies in which two-plot system was followed are Jalalabad, Baluana, Bir Akhara and Jugiana.

In Jundla colony, in Karnal district, the allottees of superior plots paid money to compensate the allottees of inferior plots. Part of this colony was overgrown with shrubs and trees. Those who received plots in this area have been given money by other allottees as the cost of clearing the jungle.

After the colony area had been demarcated into plots of equal value the next question was who should get which plot? The distribution of plots among the allottees was done by lottery system. All

the plots were numbered. Each allottee drew a lot and was allotted the plot that he drew. Groups of friends and relatives who wanted to have plots adjacent to each other selected a group leader who drew the lot, and the members of the group were given plots in the serial order in which their names were recorded in the list, with the group leader getting the first plot.

Co-operative Management

Each allottee has thus been given a plot which he will own and manage as his own property. His income as a Garden Colony allottee will be the income from the produce of fields comprising that plot. This means that, like other landholders, his interest will be confined to his own plot of land. But we have been talking of the advantages of mass scale production in gardening, of wide roads and fencing, of clean and dependable nurseries and cold storages. What practical steps have been taken to ensure the development of these facilities? The allottees in each garden colony have been knit together into a cooperative society. The general management of the colony will be in the hands of this society. The rules bind every member to devote at least ¾ths of the area to fruit garden according to the plan drawn up by the Agriculture Department. Every member is required to carry out faithfully all the horticultural operations, like production of nursery plants, irrigation, cultivation, spraying, grading, packing, preservation and marketing of fruits and such other works as may be decided upon by the society. Every member has to sign an agreement to the effect that in consequence of being a member of the cooperative Garden Colony Society he will carry out such horticultural operations as the society may direct and in the event of the breach of this undertaking he will pay the fine that Society may impose. The day-to-day administration of the Colony is to be carried on by a Managing Committee consisting of not less than 7 and not more than 9 members. Extra Assistant Director of Agriculture of the district is an additional member of the Managing Committee. These members are elected for one year by the members of the society in a general meeting.

Among the objects of the garden colony societies the following are compulsory for all members:

1. To arrange for the development of the garden colony which may include such activities as the levelling of

land, provision of water channels, roads, fencing, manuring, cultivation, etc.

2. To secure or raise nursery plants and seeds of approved quality.
3. To arrange for the supply of horticultural tools and implements.
4. To arrange for the control and eradication of plant diseases, insect pests, and obnoxious weeds.
5. To arrange for expert technical advice and guidance.
6. To train the members in the art of gardening, vegetable growing and preservation of fruits and vegetables on scientific lines.
7. To supply literature on horticulture and vegetable growing.
8. To arrange exhibitions and shows for the sale of produce.
9. To arrange for loans and grants and to receive deposits for financial assistance to members in furtherance of the objectives of the society ; and
10. To employ staff considered necessary for implementing the objectives of the society which will also include security measures.

The following facilities can be provided at the expense of the members who request for the same :

(*i*) To arrange for grading, packing and marketing of fruits and fruit products ;

(*ii*) To set up retail and wholesale shops at suitable towns, cities and other places and to erect godowns and cold storage ;

(*iii*) To arrange for the manufacture of vegetable and fruit products like squashes, jellies, jams and *morabas*, and canning and bottling of fruits and vegetables etc. and

(*iv*) To arrange for subsidiary industries like poultry, bee-keeping and dairying.

Nurseries

In horticulture the quality of plants is all important and the success and failure of fruit gardening is dependent on the quality and reliability of the fruit plants selected for planting. While in annual cropping mistakes committed in the selection of the seed are revealed at the end of

the season, in the case of perennials like fruit trees the mistakes are only discovered when the trees reach the bearing stage and by that time the savings of a life-time have been spent in nursing unwanted trees. I remember the case of a villager who wanted to raise an orchard of *Santra* oranges, practised false economy and received a gift of saplings from a friend. After six years of nursing and hard work it was found that the plants which he had received as a gift were *Khatta* oranges and not Maltas as he expected. After wasting a fortune he realized that a fruit grower cannot take risks and he should have taken plants of a pedigree stock of known quality from a reliable nursery.

Areas varying from 3 to 15 acres according to the size of the colony have been reserved in all the colonies for raising nurseries. It is expected that the colonies will raise their progeny gardens in these nurseries under the expert technical guidance of the Fruit Specialist of the Government and his staff. The nearness of nurseries will also eliminate mortality in plants which occurs when they are transported from distant places. The cost of nursery plants is a major item of expenditure in the total cost of planting an orchard. By raising nurseries in each colony the cost of planting gardens will be appreciably reduced.

Inter-culture

Only 3/4th of the area of each garden plot is to be ultimately put under fruit trees and the rest is to be utilized for raising food grain, fooder crops and vegetables. The area under the garden will be speciously laid out with fruit trees at least 30 feet apart, and a judicious programme of inter-cropping will be followed. Leguminous fodder crops like *berseem*, which yield good income and are also beneficial to the growth will be sown in the area between the rows of fruit trees. Cultivation of soil not only promotes aeration of the soil but the root-hairs of the fruit trees also get pruned thus inducing heavy bearing.

Finances

These cooperative societies have been financed partly by loans from the Government which have been advanced on a liberal scale for sinking tube-wells and for purchase of tractors and partly by levying admission fee and share money on the members. An admission fee of Rs. 5/- and share money at the rate of Rs. 50/- per acre is collected from

each member. At this rate a member holding a full unit of 20 acres has to pay Rs. 1000.

Subsidiary Occupations & Industries

In addition to horticulture the Colonies may also take up side industries like poultry, bee-keeping, vegetable seed production, dairying etc. and subsidiary industries like fruit preservation and cold storage. They may also develop facilities for leading a group life in the form of community dining halls, schools, creches for children, guest houses, clubs and reading rooms. In short they may provide themselves with an atmosphere that tends to bring out the best in the man as well as in soil.

While the members of the garden colonies will enjoy the benefit of cooperation in agri-horticultural operations where cooperative effort is remunerative, such as irrigation, nursery raising, tractor cultivation, cold storing and marketing of produce and general management, full scope has also been provided for individual initiative. Each allottee will own and manage the fields allotted to him. If a member is lazy he will himself have to suffer and he will not be a mill-stone round the neck of the cooperative society. In this respect these garden colonies resemble the Small-holders' Cooperative Village 'The Moshav Ovdim' of the Zionists in Israel. According to Mr. Kauffman, "In the settlements of this type every settler works his farm individually. In most of the other branches of the work, as also in the life of the village, the social idea predominates. Accordingly the purchase of food supplies, tools and agricultural stock as well as the sale of produce are undertaken in common through special buying and selling cooperative societies of the organized Workers' Association. The village has a cooperative dairy, cooperative machine shed, workshops, stores and shops, as well as a common dispensary provided and run by the Workers' Sick Fund."

The progress of the garden colonies will ultimately depend on the interest which the members take. In most of the garden colonies in Jullundur Division, the members actually reside in the colony areas, and good progress is expected. Unfortunately this does not apply to some of the garden colonies in Ambala Division where the number of absentee members, who mostly reside in big towns, is large. It would be advisable to make residence in the colony compulsory for the members and exemptions should be granted only in

exceptional cases where an allottee can provide a suitable nominee. Another factor which may prove critical is that of irrigation. Gardens cannot be grown without artificial means of irrigation as Monsoon in India is the proverbial flirt. Percolation wells do not yield sufficient water supply for irrigating orchards. It is to be borne in mind that the water requirements of a garden are three times that of ordinary crops. Excepting the colonies in which tube-wells are being dug and a few where supply of canal water is sufficient, in the remaining the water supply is unsatisfactory. Unless these colonies are supplied with abundant supply of water, fruit culture is not likely to make headway.

The scheme of Garden Colonies is not merely a horticultural scheme. It is also a great social experiment which will be watched with great interest by all those who are interested in progressive Horticulture. Intelligent and go-ahead farmers have been selected and given equal areas so that cooperation is facilitated. All the paraphernalia of modern agri-horticulture like tube-wells, tractors, power spraying machines etc. will be available in the garden colonies, and it is also hoped that most of these colonies will shortly be electrified. If all these advantages are intelligently exploited the colonies will in the near future answer the vision of those who conceived them as centres of agricultural and social advancement—sort of large scale model farms in the interior of the countryside.

STATEMENT OF GARDEN COLONIES IN THE STATE

District	Tehsil	Name of the Colony	Area in acres			No. of Allottees
			Total	Nehri	Chahi	
Ferozepore	Fazilka	1. Balluana	1021	829	..	55
	Zira	2. Jalalabad	548	323	171	26
	Muktsar	3. Muktsar	1233	1067	..	62
Amritsar	Amritsar	4. Khankot	716	480	182	38
	Patti	5. Patti	1038	1033	1	57
Gurdaspur	Batala	6. Dyalgarh	572	..	496	32
	Gurdaspur	7. Khojepur	764	230	95	40
Hoshiarpur	Garhshanker	8. Panam	864	..	405	41
	Hoshiarpur	9. Dalamwal	187	..	20	10
Ludhiana	Jagraon	10. Bir Akhara	256	124	..	12
		11. Agwar Khawaja Baju	546	..	255	30
	Ludhiana	12. Jogiana	784	..	352	36
	Samrala	13. Rahon	685	..	460	35
Jullundur	Jullundur	14. Boot Kingra	2220	..	1367	101
	Nakodar	15. Mahlon	970	..	722	50
Hissar	Sirsa	16. Baha-ud-din	172	174	..	9
	Hansi	17. Mirza-ki-patti	998	792	..	49
	Fatehbad	18. Mughalpura	491	303	..	26
Rohtak	Rohtak	19. Kharkhoda	600	587	..	33
		20. Lahli	435	365	..	23
	Sonepat	21. Punchhi Gujran	959	..	532	43
Gurgaon	Palwal	22. Khajurke	262	124	25	21
Karnal	Karnal	23. Jundla	2066	805	19	110
	Panipat	24. Kachhrauli	1304	407	327	67
Ambala	Ambala	25. Adohi Tolan Wali	1445	..	35	71
	Kharar	26. Khanpur	518	..	28	28
	Rupar	27. Morinda	500	..	276	28

X
ANIMAL HUSBANDRY

CHAPTER 27

CATTLE

India is essentially an agricultural country. The success of its agriculture depends on its bullock power. The country, therefore, needs such animals as can provide good and sturdy plough animals, and can also simultaneously yield milk in quantities sufficient to meet the requirements of the cultivator and his family in respect of fluid milk, butter, ghee and other milk products. The Punjab fortunately is one of the major cattle producing States in India. According to the Livestock Census of 1951, the total cattle population of the Punjab is 4292384 of which only 139290 are found in urban areas, and the rest, *i.e.* 4153094, in rural areas. Of these, cows over 3 years of age which are fit for breeding or work number 1,22,3386.

Breeding of cattle

The following breeds of cattle are found in this State :

1. The Hansi-Hissar breed.
2. The Hariana breed.
3. The Sahiwal breed.
4. The non-descript cattle.

Hansi-Hissar :

These cattle are well-built and large sized. The prevailing colours are silver grey, grey and white. They are found in the Hissar Hansi tract. They are dual purpose cattle in the real sense, both for milk and draught qualities. Their bullocks are strong and sturdy and the average milk yield of the cows is 2000 to 3000 lbs per lactation of 300 days. Their skin is rather loose, and the sheath of the male a little pendulous. Their bodies are also a little heavier than those of the Harianas, and they are, therefore, more suited to pulling heavy weights.

Hariana Cattle :

The Hariana cattle are akin to the Hissar-Hansi type. They have medium-sized compact well-built bodies. The males are fast trotters, and the cows good milkers. Thus they are also dual purpose animals, though better suited for milk production.

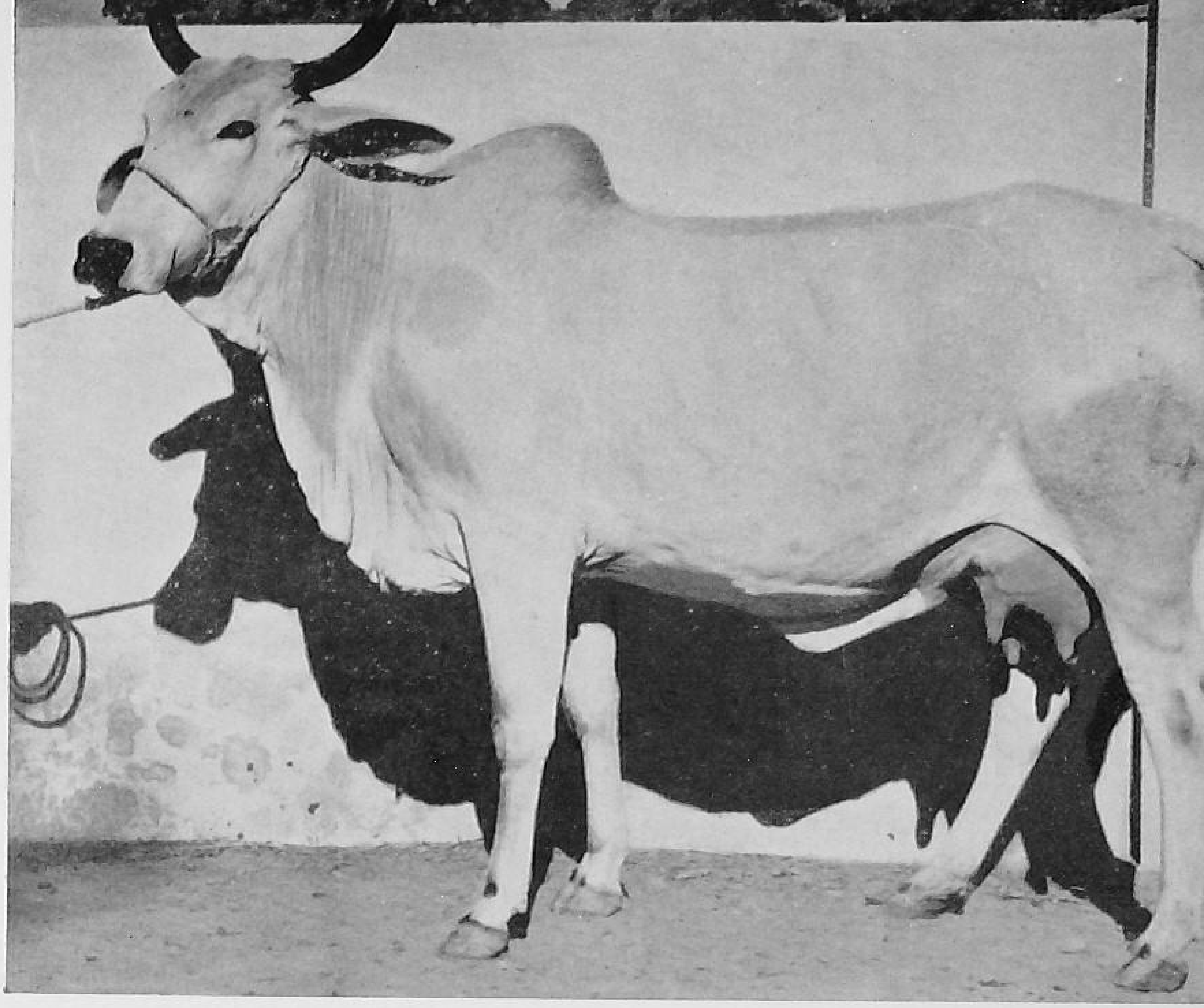
The average milk yield of a Hariana cow ranges between 2000 lbs. to 4000 lbs. per lactation of 300 days. Their home is in the Hariana Prant, comprising Hissar, Rohtak, Gurgaon, Karnal and some parts of Ambala District. They are, however, centralised in the Jhajjar and the Beri Tehsils where they are found at their best. The Animal Husbandry Department Punjab is now encouraging the Hariana breed, and is trying its best to increase the milk yield of the animals by judicious selection of breeding bulls and by culling cows which have comparatively less milk under them. The Hariana cattle are in great demand all over India and even abroad.

Sahiwal or Montgomery Breed:

These animals have a comparatively small and compact body with large udders and well developed teats. They are usually red, brown or black in colour. The cows of this breed are heavy milkers. Their average yield ranges between 4000 to 6000 lbs. of milk per lactation of 300 days. Cows with an average of 8000 to 10000 lbs. of milk or more are also met with for dairying. This breed is, therefore, essentially a milch breed, suitable for dairying. The bullocks are not considered very suitable for the plough as they are not so sturdy as those of the Hissar-Hansi and Hariana breeds. The home of this breed is in the Montgomery and Multan districts, the so-called 'Sahiwal Tract' which now forms a part of the West Punjab (Pakistan). Being essentially dairy animals, cows of this breed were imported from Montgomery and Multan districts from time to time before the partition, and are now found in almost all large towns, particularly in the Jullundur Division. A sufficient number of these cows is, however, found in the Jalalabad tract of the Ferozepore District adjoining the Montgomery district. This area is now being developed as the Sahiwal breed tract in the State.

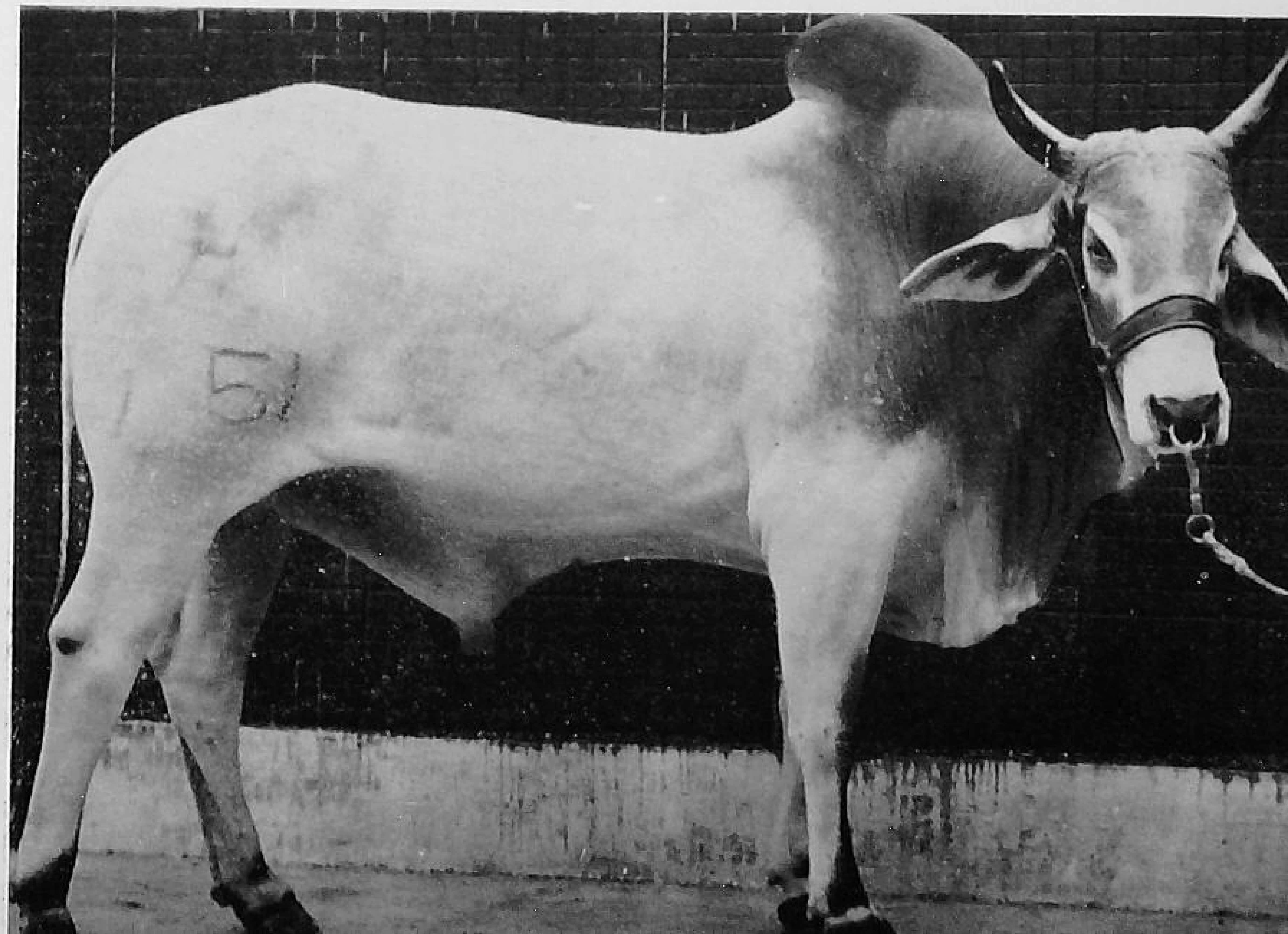
Non-descript Cattle:

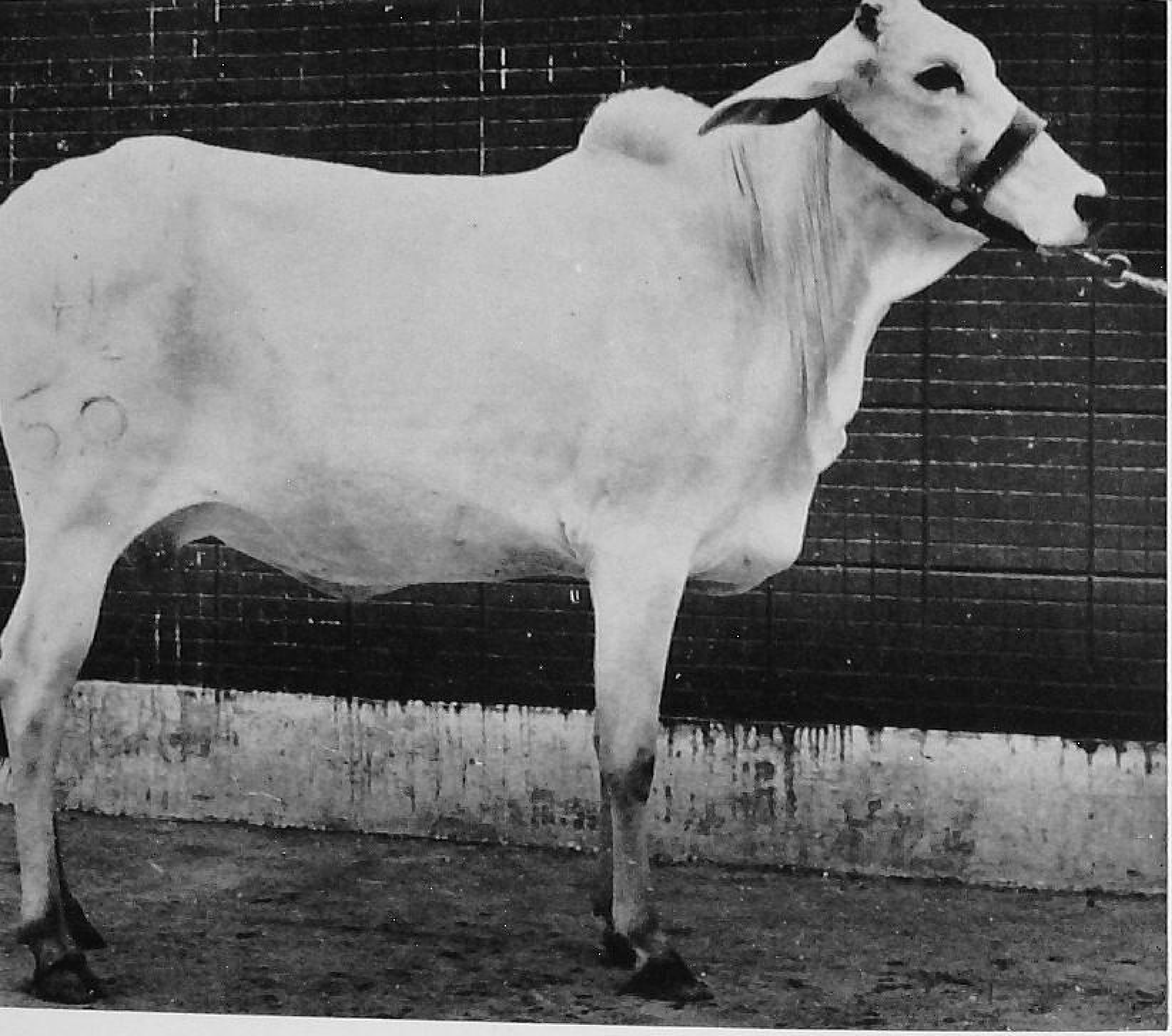
There are still many areas in the Punjab where cattle of any distinct breed are not found. Cattle in such areas are the result of unplanned crossing or admixture of different breeds, having mixed characteristics. Such cattle cannot be depended on for milk or work. They are generally found in parts of the sub-montane districts of Hoshiarpur, Gurdaspur and Ambala. It is these animals that need particular attention and improvement.



Hissar cow

Hissar bull





Hariana cow

Hariana bull

Breeding

Bulls of the three breeds enumerated above are approved by the Veterinary Department for breeding or on purchase from the Government Livestock Farm, Hissar, are let loose by the District Boards in villages for free service. According to the Cattle Census of 1951 there are 5237 bulls over 3 years of age kept or used for breeding only in the State. There are 1214343 cows over 3 years of age kept for breeding or milk production. On the standard basis of 1 bull for 100 cows there should be at least 12144 bulls at stud against the existing number of 5237. Thus the number of bulls available for breeding is less than even half of the actual requirements of the State.

Source of Supply

To produce pedigreed bulls, the Punjab Government is maintaining the Government Livestock Farm, Hissar which with a basic herd of 3000 Hariana cows is producing annually about 600 bulls of this breed. Out of these, about 400 are absorbed in the State to meet replacements due to casualties among them and to add to the existing number. The remaining 200 are sold to other States and Unions of States in India, to meet their requirements of animals of this breed. In addition, a herd of 50 Sahiwal (Montgomery) cows is also being maintained at this Farm since the partition. As the demand for animals of this milch breed is on the increase, the Advisory Committee of the Government Livestock Farm, Hissar, has recommended the raising of the herd from 50 to 200 cows immediately, and to 500 cows in the course of the next few years. As soon as the strength of the herd is raised, as proposed, it will be possible to supply pedigreed 70 to 100 bulls of this breed every year.

Artificial Insemination

The present annual production of bulls is not sufficient to meet the requirements of the State, let alone those of the other States. Moreover some bulls are of outstanding merits having better milk strain and/or draught qualities as compared with the majority of the bulls found or produced in the State. If such bulls are used for natural service only they could mate with just a limited number of cows coming into heat within this range. In order, therefore, to meet the shortage in bulls and to make the maximum use of first rate bulls, a scheme of artificial insemination has been launched. Under the Key Village Scheme, six Artificial Insemination Centres have already been established

with Key Villages attached thereto as under:

Artificial Insemination Centre	No. of Key Villages
1. Government Livestock Farm, Hissar	4, working since 1951
2. Punjab Government Dairy Farm, Chandigarh	4, working since March, 1954
3. Ludhiana	4, -do-
4. Phillaur	4, -do-
5. Khalsa College Dairy, Amritsar	2, -do-
6. Gaushala, Rewari	2. -do-

The cost of this scheme is financed jointly by the Punjab Government and the Ministry of Agriculture, Government of India, on 50:50 basis. Under this scheme 4 selected bulls are located at each Artificial Insemination Centre and 2 in each Village. Bulls in the village are meant for natural service and those at the Artificial Insemination Centres for artificial insemination. Semen is collected artificially, preserved and used for artificial insemination of cows coming into heat and brought to the centre or the selected villages.

In addition to those set up under the Key Village Scheme, Artificial Insemination Centres have also been established under the Community Project Development Blocks and National Extension Service Blocks and some of the Marketing Committees. The Services of the bulls stationed at these places should be utilised fully as they are the selected animals considered suitable for different tracts. The details of these centres are given below:

Community Projects

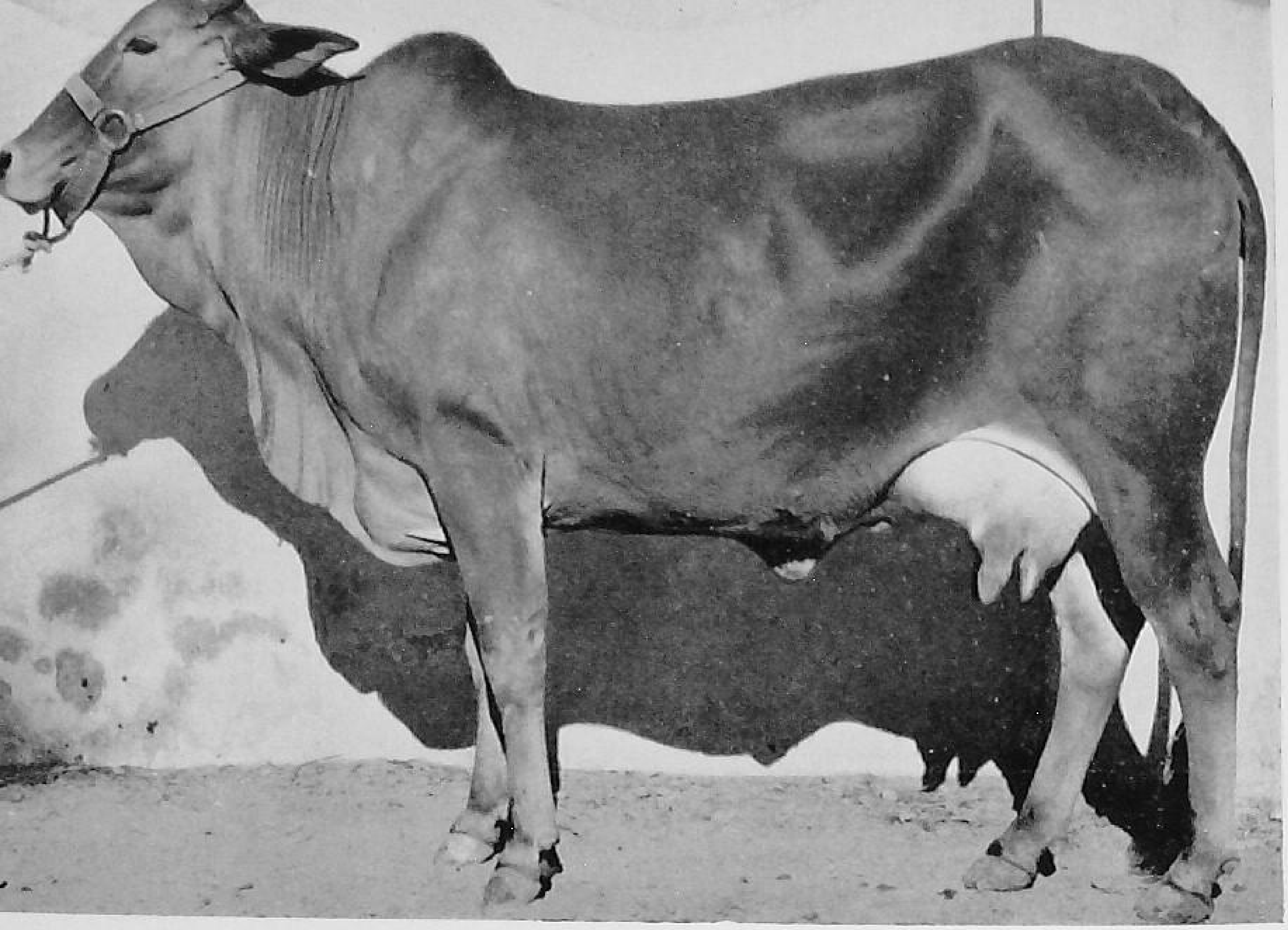
1. Batala District Gurdaspur.
2. Jagadhri District Ambala.
3. Nawanshahr District Jullundur.
4. Nilokheri District Karnal.
5. Faridabad District Gurgaon.
6. Sonepat District Rohtak.

Marketing Committees

1. Sanehwal District Ludhiana.
2. Moga District Ferozepore.

A herd of Hissar breed cows

Government dairy farm, Chandigarh



Sahiwal cow

Sahiwal bull

Mating

Cows come into heat at regular intervals. They should be given natural service or should be inseminated artificially within 12 hours of the appearance of oestrous. The period between service and calving is between 281 and 296 days. Cows generally go dry in the 6th to 8th month of pregnancy, and they remain so till they calve. The quality of calf or progeny depends on the type of bull used for service. Therefore the bull should be an approved one, preferably having a good pedigree behind it.

Calving

Only one calf is born at a time. Twins are very rare. The dry period varies between 1-2 years under stall-feeding.

Feeding

A statement showing the scale of rations prescribed for feeding of bulls, cows and youngstock is enclosed. Cows in milk should be given maintenance ration according to the body weight plus the milk yield as shown in the attached statement.

Dry cows and youngstock should also be given proper attention and ration at the scales shown in the statement.

Cattle need exercise, and natural grazing too. Common grazing grounds should be set apart in villages where rotational grazing should be provided.

Housing

Like human beings cattle also need to be housed in proper sanitary sheds. The system of keeping cattle tied up in the streets and dark passages of residential houses or in their close vicinity is not only harmful to human beings living in such areas but also bad for the health of the cattle. Sheds for cattle should be away from residential quarters and should be well ventilated. Each animal should have a space not less than 6′ x 4′ with a sloping *pacca* floor so that daily refuse, *i.e.*, cow dung and urine, could be properly washed and drained off. Where flooring of sheds is *kacha* arrangements should be made to remove cow dung and urine both in the morning and evening and to keep the floor dry by putting dry earth or using *pralli*. The shed should have a good manger (*Khurli*) and clean watering arrangements. These precautions will keep both cattle and human beings living in that vicinity in health.

Milking

Before milking, the udders should be washed with clean water. Milking pails (utensils) should be thoroughly cleaned and washed, they should preferably be washed with washing soda. Hands of the milkmen should also be properly washed with soap. In the early lactation periods one teat should be left untapped for the young calf upto the age of three months. After milking, the milk should be kept covered with a lid or clean cloth. Milk is a highly perishable commodity. If it is for household consumption, it should be immediately removed to the kitchen, where it should be boiled and then kept for use when required. If it is put in the market even then arrangements should be made to transport it to the consuming market as quickly as possible lest it should get spoiled or contaminated. The best course is that all the surplus milk in a village should be pooled together at the fixed hours, and then transported to the consuming market in insulated motor-vans on cooperative basis. Moreover detailed instructions will be found in the Chapter on Dairying.

Castration

In order to improve the breeds of cattle and to avoid getting inferior progeny it is essential that cows should be mated with the best selected bulls approved by the Animal Husbandry Department. Simultaneously, it is necessary to avoid chance coverings by inferior bulls. This can be done only if all inferior male stock and scrub bulls which are considered unsuitable for breeding are castrated. The Animal Husbandry Department undertakes to castrate all such stock if brought to any Veterinary hospital for the purpose. The Veterinary Assistant Surgeon in-charge of the *ilaqa* Veterinary Hospital and the Stock Assistants employed in the area also undertake castration work in the course of their tours in villages. Castration campaigns are also arranged by the Department on mass scale periodically. Advantage should be taken of the facilities thus provided. It may be noted that castration by means of a Burdizo castrator is bloodless and almost painless operation which takes no time. The best age for castration is from 14 to 18 months.

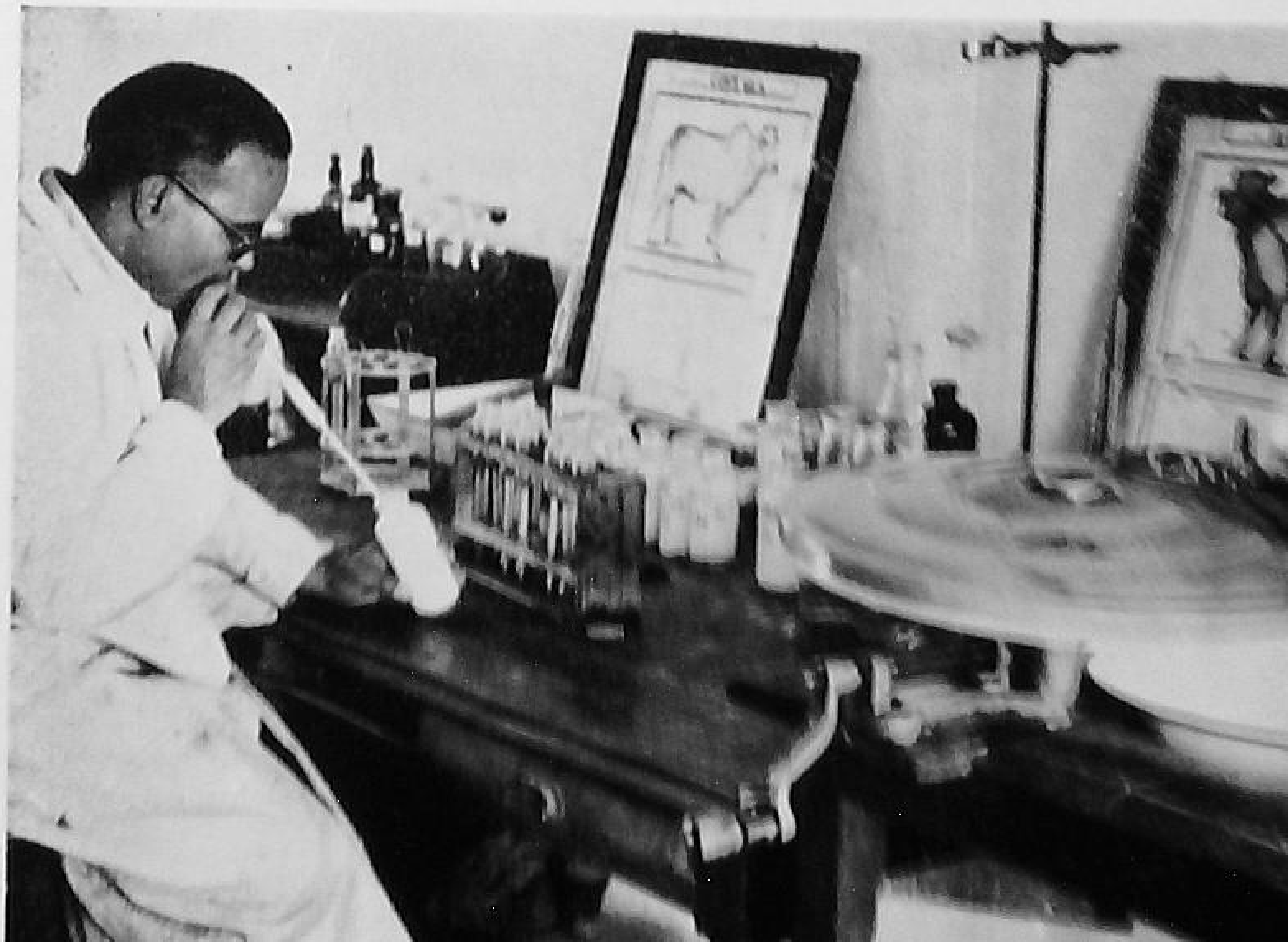
Protection of Cattle against Contagious Diseases

Various contagious and infectious diseases amongst cattle take a heavy toll of life every year. The most important of these are :

(*i*) Rinderpest

Treating animals for foot diseases

A well equipped laboratory at the Government dairy farm, Hissar



(*ii*) Haemorrhagic Septicaemia

(*iii*) Foot and Mouth Disease

(*iv*) Black Quarter

The Department has set up a Veterinary Biological Products Section at the Punjab College of Veterinary Science and Animal Husbandry at Hissar where the staff is engaged in producing various types of sera and vaccines to combat these and other diseases amongst livestock. Prophlactic vaccinations and inoculations are carried on systematically every year on mass scale.

All cattle should be got immunised against Rinderpest invariably. The vaccinations done once against Rinderpest confer an immunity for about three years. Therefore every animal should be re-vaccinated, and the operation repeated every three years. If there is an outbreak of this disease in any area all animals in it should be re-vaccinated even before the expiry of the period.

Vaccinations against Haemorrhagic Septicaemia and Black Quarter should be done twice a year—once before the onset of summer rains, and again before the onset of winter rains. The immunity though quite potent lasts, for only 4 months. In the event of an outbreak of the disease all these vaccinated animals should be re-vaccinated.

For the Foot and Mouth Disease a vaccine has been prepared but is yet in experimental stage.

The policy of the State Animal Husbandry Department in respect of breeding of different types of cattle is well defined and set.

Breeding Policy

The breeding of Hariana cattle which are dual-purpose animals is being encouraged in rural areas of almost all districts of the Punjab except Simla and Kangra, and the Jalalabad tract of the Ferozepur District. District Boards and other local bodies purchase Hariana bulls from the Government Livestock Farm, Hissar, and let them loose in their districts. Hariana cattle thrive well in all these districts. The Community Projects and National Extension Service Blocks also provide bulls for natural service from their budgets. The surrounding areas of Simla town are in the Himachal Pradesh. To meet the milk requirements of the town, Simla depends upon the local hill

cattle or cows and buffaloes imported from the plains. In the Kangra District, the local hill cows are of very small size and extremely poor milkers, yielding on the average 1/2, 1, or at the most 2 lbs. of milk a day. The Punjab Government and the Indian Council of Agricultural Research have, therefore, jointly sanctioned a scheme of establishing a Cross Breeding Station for crossing local hill cows with bulls of the Jersey breed by means of artificial insemination. Imported bulls of the Jersey breed will be kept at Bangalore, and their semen will be transported by air to selected villages round about Palampur, Dharamsala and Kulu artificial insemination. In the rest of the Kangra District small sized Montgomery (Sahiwal) bulls are supplied and located in urban and sub-urban areas. The object in doing all this is to infuse more and more milk in the local hill cows by cross breeding. The Jalalabad tract of the Ferozepur District is being developed exclusively as Sahiwal Tract. Pedigreed Sahiwal bulls from the Government Livestock Farm, Hissar, and Indian Agricultural Research Institute, Delhi, are issued to the tract through the District Board, Ferozepure. This Board is also encouraged to obtain good bulls of this breed from other sources such as Central Government Cattle-cum-Dairy Farm, Karnal, and Military Dairy Farms in Northern India.

Cattle Fairs and Shows and Marketing of Cattle

Over 350 cattle fairs and shows are held every year all over the State. These provide very good markets for cattle where buyers and sellers gather together. These also provide means for gauging the extent to which the livestock industry has improved as a result of the efforts made by Government. Some of these fairs are very big, and attract thousands of cattle every year. Judging of cattle takes place at these fairs, and medals and prizes in cash and kinds are awarded to those adjudged as best in each class. The District Boards and other local bodies arranging these fairs and shows earn good income from them in the form of cattle tax on sales which take place there. The names of some of the important cattle fairs which are held in the State are given below:

1. Diwali and Baisakhi Horse and Cattle Fairs, Amritsar.
2. Jehazgarh Cattle Fair, District Rohtak.
3. Bahadurgarh Cattle Fair, District Rohtak.
4. Moga Cattle Fair, District Ferozepure.

5. Muktsar Cattle Fair, District Ferozepore.
6. Hissar Cattle Fair, District Hissar.

In addition, the All India Cattle Show Society, New Delhi, holds All India Cattle Show cum Northern Region Cattle Show every year at Delhi or other suitable places.

CHAPTER 28

BUFFALOES

The buffalo is essentially a dairy animal. It is a high milk yielder, and its milk has a very high percentage of fat, ranging from 7 to 8 or even 9%. The animal is in great demand in large towns all over India. The Punjab, which is the foremost buffalo-breeding State in India, exports these animals in thousands every year. The total buffalo population of the State as per Livestock Census of 1951 is 2551708, of which she-buffaloes over 3 years of age kept for breeding or milk production number 1366612. The average annual milk yield per buffalo in the Punjab works out to 2320 lbs. as compared to 1445 lbs. per cow. It is this higher milk yield coupled with more fat percentage which has caused this animal to be in great demand everywhere.

Breeds

The Punjab has the following breeds of buffaloes:

1. The Murrah buffaloes
2. The Ravi-Nili buffaloes

Murrah Buffaloes:

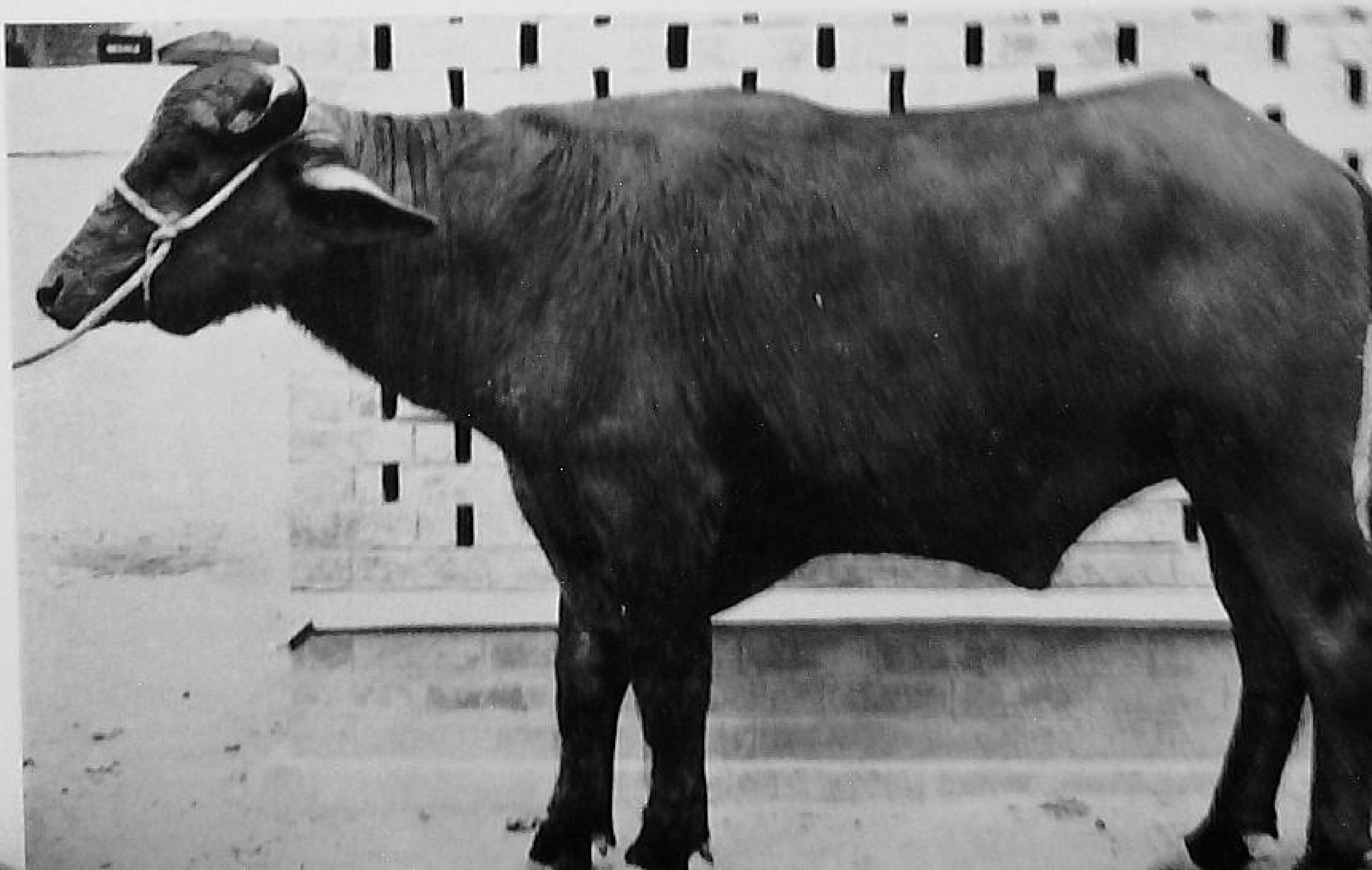
The Murrah buffaloes take their name from the curved horns which they possess. They have a heavy massive body, and are usually of black colour except the switch of the tail which is white. They have a typical bulging head and bulging shoulders with large udders and long teats, and tail almost a little below the hock. The real home of this breed is Rohtak District of the Ambala Division. They are also bred in large numbers in other districts of the Ambala Division, particularly in Hissar, Karnal and Gurgaon. The buffalo does not need much exercise. It is a stall-fed animal, easy to handle. She-buffaloes of this breed are being exported in thousands to all big towns not only in the Punjab but throughout India—particularly to Calcutta, Bombay and Madras.

Ravi-Nili Buffaloes:

Buffaloes of this breed have their home in the Satluj-Ravi belt, and are found in large numbers in Ferozepur, Amritsar, Gurdaspur, Jullundur and Ludhiana districts. They are also of quite heavy build

Murrah buffalo

Murrah bull



with large udders and big teats, and give good milk yield. They are rather finer in type than the Murrah stock. The neck is thin, the head fine, the horns curly, and the tail almost touching the ground. The animal may be all black or brown, but the one having white spots on the head and all four legs is preferred. It is popularly called the "*Panj Kalayani*". Like Murrah buffaloes these buffaloes are also being exported in large numbers outside the State.

The she-buffalo is a very paying animal. Its milk yield amply covers the cost of its up-keep, and leaves over something for domestic needs of milk, ghee, and butter of the keeper. If sold, it fetches a good price. An average buffalo can be sold for Rs. 500 to Rs. 700 The price of a good buffalo goes up to as much as Rs. 1,000. It is, therefore, well looked after. The male progeny is, however, neglected, and is almost starved to death. The reasons for this neglect are not far to seek. The male stock is not good for work purposes as are cow-bullocks, and all the male progeny is not required for stud. Unlike cow bulls, if he-buffaloes are castrated they wither away in a short time and become useless altogether. It is therefore a problem to find really good buffalo bulls for breeding purposes. There are at present 7302 buffalo bulls at stud in the State. At the rate of 1 buffalo bull per 100 she-buffaloes there should be 13666 bulls. The State is therefore almost 50% short of bull requirements.

At present young buffalo bulls are allowed to be purchased by the District Boards locally and to be let loose for stud purposes. These bulls have no recorded pedigree behind them, and it is not known which bull has a milk strain and should be regarded as a standard one. There has been no buffalo farm in the Punjab after the partition ; the Bahadur Nagar Buffalo Farm, district Montgomery, the only buffalo farm in the Joint Punjab, was left in West Punjab. To meet the demand for pedigreed Murrah buffalo bulls, a small herd of 100 she-buffaloes was established at the Government Livestock Farm, Hissar, soon after partition. The Advisory Committee of the Government Livestock Farm, Hissar, has recommended the raising of this herd from 100 to 200 immediately, and to 500 in the course of the next four years. With the purchase of 100 best selected buffaloes, cows and one or two breeding bulls, new blood will be infused in the herd and it will be possible to multiply it in the course of the next few

years. It will then be possible to increase the supply of pedigreed buffalo bulls to the Hariana Districts for breeding purposes.

Under the Second Five Year Plan it is proposed to establish a small Ravi-Nili Buffalo Breeding Farm in the Ferozepur District to meet the needs of the pedigreed stock of this breed. Meanwhile buffalo-breeding is being encouraged through artificial insemination at the Artificial Insemination Centres established under the Key Village Scheme or at those set up in the Community Project areas and Market Committees, where buffalo bulls are also kept for the purpose.

Buffalo bulls are also being purchased locally out of Community Project funds and put in villages for breeding purpose.

Mating and Calving

The buffaloes are mature for breeding at the age of 3 years. When they come into heat they should be mated with the best available approved bull or inseminated artificially within 12 hours of the appearance of oestrous. The gestation period in buffaloes is on the average 300 days. The buffaloes go dry after 8 to 9 months after calving. The dry period ranges from 4 months to 6 months. A buffalo on the average has six to seven calvings in her life time.

Feeding

A statement showing the scales of rations prescribed for buffaloes which is based on body weight of the animal is enclosed. The milk yield in buffaloes can be improved to a certain extent, if milk production ration is given in addition to the maintenance ration. Buffalo is a stall-fed animal and does not need much exercise or grazing in the field.

Housing, Care and Management

Like cattle, buffaloes need to be properly housed. Buffalo sheds should be provided away from human residential quarters and should be well ventilated. They should have properly built mangers (*Khurli*) with adequate facilities for clean drinking water. The floor of the sheds should, as far as possible, be *pucca* and sloping so that after removing dung it can be thoroughly washed and cleaned of all rubbish, urine and bad smell. This will keep away mosquitoes, flies, ticks, etc. which adversely affect the health of these animals. If *pucca* flooring is not possible, after removing rubbish daily, dry earth should be spread to give the place a neat and clean look. Each buffalo should have

enough space for the cattle to stand and sit comfortably. It should not be less than 4-½′×6′. Buffaloes should be washed with fresh water daily or allowed to enjoy dips in village ponds, streams, or river side, where they love to wallow. They should be groomed and massaged at regular intervals.

Milking

The buffalo yields on the average 6 to 8 seers of milk per day during the lactation period of 300 days. There may be buffaloes which may be yielding milk from 15 to 20 seers per day at the peak of lactation. The highest yield of milk is during the 3rd to 5th lactation. Before milking the buffaloes, the udder should be thoroughly washed with clean water. Similarly, the milking pails or buckets should be cleaned and washed with washing soda. The milk man should also wash his hands with soap. Only three teats should be milked in the early period of lactation leaving the 4th one for the calf for at least three months.

Protection against Common Contagious Diseases

The contagious diseases which affect cattle also affect buffaloes like-wise, and the same precautions should be taken as are necessary in their case. In the case of illness or out-break of any contagious diseases the nearest Veterinary Assistant Surgeon Incharge Ilaqa Veterinary Hospital should be consulted.

Registration and Milk Recording

For building up pedigreed herds and selecting good bulls for breeding purposes it is necessary that buffaloes should be registered and their milk yield be recorded weekly or fortnightly. The village level workers or local village panchayats should undertake this work under the guidance of the local veterinary staff.

CHAPTER 29

DAIRYING

In the Punjab, where a fairly large proportion of the population is vegetarian, milk and milk products constitute the only source of animal proteins. Inspite of such vital importance of milk and milk products in our diet, the daily per capita consumption, though slightly better than that in other States of the country, is meagre and does not compare favourably with that of other progressive and civilised countries of the world. It is, therefore, of utmost urgency and importance that for building a healthy and strong Punjab our milk production must be further increased and its handling properly controlled. To achieve this end the following steps should be taken:

(1) Milk production and its marketing are inter-dependent factors. Unless the marketing aspect which really merits expert handling, is tackled first, no benefit can be derived from milk production to whatever extent it may be increased. The marketing aspect has earned a very bad name, and there is lot of indiscriminate and unhealthy competition going on which is acting as a stumbling block in the way of the proper development of the dairy industry. It is in fact the bad milk which is driving away the good milk from the cities. The supply of milk through innumerable middle men is not at all conducive to the development of this industry. It is absolutely necessary that the entire milk supply of a town should be canalised through one or more proper organisations over which there could be proper check and effective control. This should be done on modern and scientific lines. Large towns should have pasteurisation plants, bottling plants, and automatic steam and bottle washing plants. The cost of each such unit will be about Rs. 3½ lakhs. Before setting up such organizations, effective legislation and municipal bye-laws will have to be passed in regard to constituting Milk Marketing Boards.

(2) Keeping of milch cattle in cities is very uneconomical and insanitary. Besides being expensive, they constitute a great menace to the public health. Every effort should be made as expeditiously as possible for the wholesale removal of animals from city stables to the countryside where they can be kept under natural conditions and more economically. Till such time as adequate rural milk supply is organized to meet the entire needs of big towns, the milch animals may be removed to and resettled in special self-contained milk colonies set up in suitable areas providing adequate accommodation for cattle and their owners and facilities for growing fodders.

(3) In the interests of the economic uplift of the villagers and the improvement of the cattle, and for increasing the output of milk it is considered essential that rural areas should constitute the main source of the milk supply in the State. It has been seen that if milk is imported from distant places the villagers begin to evince keener interest in the production of milk ; they maintain more animals of better breed, and feed them better too.

The resources of the cultivator milk producer are very limited and very little can be achieved through his individual efforts. The most successful co-ordinated effort in this direction which can be achieved would therefore be through the organisation of co-operative milk producing societies in the villages and federating them for the supply of milk to the urban areas. Experience has, however, shown that with a highly perishable article of food like milk, an effort on a large scale is required to be made for its collection and marketing. For this the men in the trade do not possess the necessary wherewithal. To begin with, therefore, it is necessary that the efforts should be made through a Government agency, and after the position is stabilised the organisation may be changed over to a co-operative body. For milk collection in rural areas the following arrangements shall have to be made :

(*a*) A jeep with a trailer for the transport of milk from the collection centres in the rural areas to the processing plants in the cities. It would cost approximately Rs. 12500.

(*b*) Specially insulated vans for the transport of milk are now available in which milk can be cooled and transported without any rise in the temperature. Each such van costs about Rs. 35000.

(*c*) Special type of milk cans with ice-chambers are very essential during the summer months to keep down the temperature. Such cans with a capacity for about one maund of milk will cost about Rs. 50 each.

(*d*) At the main milk collection centres in the rural areas setting up of the milk cooling plants and cold storages would be essential. Each such unit would cost about Rs. 20,000.

The Bombay Government formed Kaira Co-operative Milk Producing Union, Anand, which is collecting milk from 80 villages in the vicinity of Anand City. These 80 villages are producing more than 1000 maunds of milk which is being collected, processed, and sent to Bombay for distribution. This scheme has proved a grand success and brought about marvellous economic uplift among the village milk producers. What has been done there can also be repeated in the Punjab without much effort and cost and the staff working in the Community Project areas and National Extension Blocks can learn a lot by studying the actual working of the Anand Scheme.

Milk pockets in rural areas which are not accessible to procurement organisations and from which transport of milk is likely to be expensive may be utilised profitably in some other ways. Creameries with good cream separators may be installed in such areas for the extraction of cream which without fear of adulteration can easily be turned into butter and ghee for urban consumption. These steps would enable us to solve the difficult problem of providing pure butter and ghee in the urban areas and at the same time give incentive for the production of more milk in such pockets by providing them reasonable cash returns. The separated milk thus got can be profitably converted into casein which is in great demand. A cream separator with a capacity to separate about 10 to 12 maunds of milk per hour costing about Rs. 500 would suffice for each creamery.

As it would take time to implement the above mentioned suggestions, the following interim measures are recommended for immediate action :

(*a*) Cattle stables in cities should be licensed and movement of cattle allowed under a permit only.

(*b*) Breeding facilities should be made available free.

(*c*) Import for fresh animals should be restricted so as to prevent growth of city milch cattle population.

(*d*) Salvage farms should be set up. Selected *Gowshalas* and *pinjrapoles* with the necessary facilities should be provided with additional facilities and funds for undertaking salvage work.

(*e*) An export fee of Rs. 20 on every milch animal exported from the State should be levied. The money so realised may be used for setting up Milk Marketing Boards and Statistical and Cattle Registration Sections.

(*f*) The cash loans granted at present to individuals or private bodies for the purchase of milch animals etc. may be stopped forthwith as these do not in any way further the cause of Dairy Development.

(*g*) Survey should be carried out to locate areas potentially suitable for setting up milk condensing or drying plants and setting up creameries.

(*h*) The technological, organisational and economic problems involved in the long-distance transport, pasteurisation, bottling, distribution etc. should be got worked out through the dairy development section of the Animal Husbandry Department.

CHAPTER 30

GOAT

The goat is rightly regarded as " poor man's cow ". Its cost of maintenance is next to nothing. It eats anything that it can get, yet it hardly does any grazing. It loves browsing and lives principally on it. The leaves of trees, the twigs of the growing young plants, the budding flowers, and the fruits of thorny bushes are its delicacies. It nibbles away the sprouting plants causing much damage. It is only on account of this reason that the forest people regard it as a 'vermin.' They discourage its propagation in all possible manner *viz.*, by the levy of taxes as Tirni in the Kulu Valley, and by the enforcement of certain clauses of Forest Acts no matter whether the forests are 'reserved' or 'un-reserved'. Its entry in certain regions is totally banned.

With all its faults, it is a very useful animal. Its milk is much in demand in the hot summer days, and its flesh throughout the year. A very large majority of the people in India prefers its flesh to that of the sheep.

It has been proved by analysis that its milk has the same chemical composition as human milk. So, it is the right kind of food for infants. It is very easily digestible, too. The chances of any tuberculosis infection are also remote in this animal on account of its healthy out-door life.

Breeds

The Punjab is the home of very good goats. The Beetal breed is the best in India for its milk production and is in no way inferior to the Jumna Pari of West Bengal and the Berberri of Uttar Pradesh and Central India. Its real home, before the partition, was in the Sialkot, Gujranwala, and Gujrat districts. In Punjab (India) it is found at its best in the Gurdaspur district. For several decades Batala Tehsil has been leading in Goat Husbandry. This Tehsil can rightly be proud of its flocks which are the result of skilful and discriminate breeding. Some of these animals give as much as 12 lbs. of milk per day, but the average is about 4-6 lbs. The Beetal breed has got loppy

Beetal goats

Beetal bucks

ears, violet eyes and wavy horns. On the buttock there is a pad of long hair. In the males there is also a beard though not so prominent. The udder and the teats are very well developed which are perhaps not so well developed in any of the other Indian breeds of goats. The common colours are red, white or spotted.

The Lahauli goat enjoys its popularity in all the Himalayan ranges. It is the king of the hill goats in India. Its huge massive body, long white coat of hair all over, long beard, and majestic pose make it the envy of the goat population everywhere. Its dressed carcase for meat could weigh as much as 1 maund in the case of the male and 20-25 seers in the case of the female. The average should be taken as 25 seers. It is a very good climber of steep rocks and can stand the heavy snow-falls. Its flesh is rather tough, its yield of milk is very poor. In most cases the quantity just suffices to rear its own young ones. The fleece is also very coarse and valueless, and could only be used for the manufacture of ropes and bags for carrying goods in hill areas. The animals are almost white in colour, if pure-bred. They are usually taller than the goats of the plains, age for age. The horns are rather long with some curves in them lengthwise.

The Chigu goat of Tibet is an animal of great novelty in the Kulu Valley being bred and reared in Tibet. It is brought to the lower ranges as a beast of burden carrying on its patient back products of the Tibetan Valley to exchange with those of the Kulu Valley. It is a much smaller animal but very hard and compact. It has a double coat on its body, the outer one being all coarse hair, and the lower one of very fine quality, popularly known as 'Pashmina.' Pashmina has got good market in India, and is an expensive commodity. It is said that this breed of goat is also now being bred and reared in the Upper Ranges of Lahaul adjoining the Tibetan border.

Goat Husbandry

Goat is very sensitive to its environments. It requires change very frequently. If confined to one place for a long period, it withers away. It not only likes variety in food but also in its housing and outdoor life. This should be borne in mind by all lovers of goats.

A stud goat should never be kept in a milch flock. Its sebaceous glands impart a goaty smell to the milk. It should be routine practice to let the buck stand at a way-side place from where the does

are to pass. It would pick up the animal in heat, and do the covering. Immediately after that it should be removed from the flock. The mating should be so arranged that calving takes place about the beginning of April and lactation lasts throughout the summer when the demand for goat milk is very high.

Some concentrates should always be given to the stud goats when the coverings are numerous. One pound of mixture of gram and barley (equal parts) coarsely ground would suffice. Similarly high milkers out of the female stock should get this ration too according to their milk yields. Some common salt must always be mixed with it, say $\frac{1}{4}$ to $\frac{1}{2}$ oz. per day per adult animal. The females should be milked only twice a day, but if their yields are high a third milking is also recommended.

During the long winter nights the animals should be fed at night time also, otherwise they lose their condition and go down in milk yield. The best food for this season is the dry leaves and fruits of *Zizyphus Nummularia* (Jhar Ber or Kokan Ber). This food is popularly known as *Pala*. It is so to say green meat for the goats. It also increases their milk yield to a remarkable extent.

The female kids become mature at the age of 14 months when they should be mated. The males should be used a little later and in the first year they should be used rather sparingly.

The gestation period of a doe is from 145 to 150 days. It rarely gives one kid ; usually twins are born. Triplets are fairly common, and quadruplets are not rare. They should get sufficient quantity of mother's milk till they begin to browse themselves. They should be kept away from their mothers till the milking time. Care should be taken that they are not over-crowded. Sufficient shade and water should be provided to them during the hot summer days, and plenty of sun and exercise during the winter.

The period of lactation in the doe is usually 167 days. It should not be prolonged unnecessarily; otherwise it would affect the milk yield in the following lactation. The dry period is usually 114 days.

The kids should be castrated when 10 to 12 months old if not required for stud purposes.

Breeding Operations

The Beetal breed has spread throughout the Punjab, except the Kangra district. Lovely flocks are to be seen everywhere. The keen interest of the people in this breed accounts for its multiplicity so rapidly. Moreover the expense to rear them is very little and returns on the money invested are very good.

The Hariana tract is rather backward in goat husbandry and is now receiving the attention of the Animal Husbandry Department, Punjab. Grading up of the local flocks is being done through the issue of pedigreed stud bucks from the Government Livestock Farm, Hissar, at a concessional rate of Rs. 12/8 each. All undesirable and inferior local male stock is being eliminated by castration. The Government Livestock Farm, Hissar, is maintaining a large flock of pedigreed goats with the sole object of producing the pedigreed stock for up-grading the village goats. Goat Industry is almost entirely in the hands of the depressed classes, but they are very keen breeders.

The Lahauli Goat has already reached its perfection in the hands of Gaddis and the Lahaulas. Being bred purely for their meat and hair, breeding of animals is carried on by 'selection' only. It is now being considered seriously by the Animal Husbandry Department that this breed should be crossed with the Angora Goat of South Africa. Experiments are already being made in the Uttar Pradesh, and the results are awaited.

The Chigu goat should be propagated in the high ranges of the Kulu Valley, the climate of which is almost identical with that of the home of this breed. It is proposed to take up this work by establishing a goat farm at a suitable place in the Valley. The question has already been taken up in the Second Five Year Plan.

CHAPTER 31

SHEEP

The Punjab is the home of several indigenous breeds of sheep. These enjoy popularity throughout India. They are confined to certain regions. The best types are met with either in the dry arid tracts or in hill areas. The two most important ranges or belts are (*i*) Sirsa-Abohar-Fazilka, on the border of the West Pakistan, and (*ii*) the high ranges of the Himalayas from the Tibetan border to the lower ranges of the Kulu, Chamba, and Kanara Valleys. The rest of the districts in the Punjab do not show any demarcated tracts. No doubt the districts of Rohtak and Karnal also have some high class sheep of the Bikaner breed. Sheep breeders in these districts invite the migratory sheep flocks to their grazing areas which, particularly in the Karnal District, abound in scrub jungles.

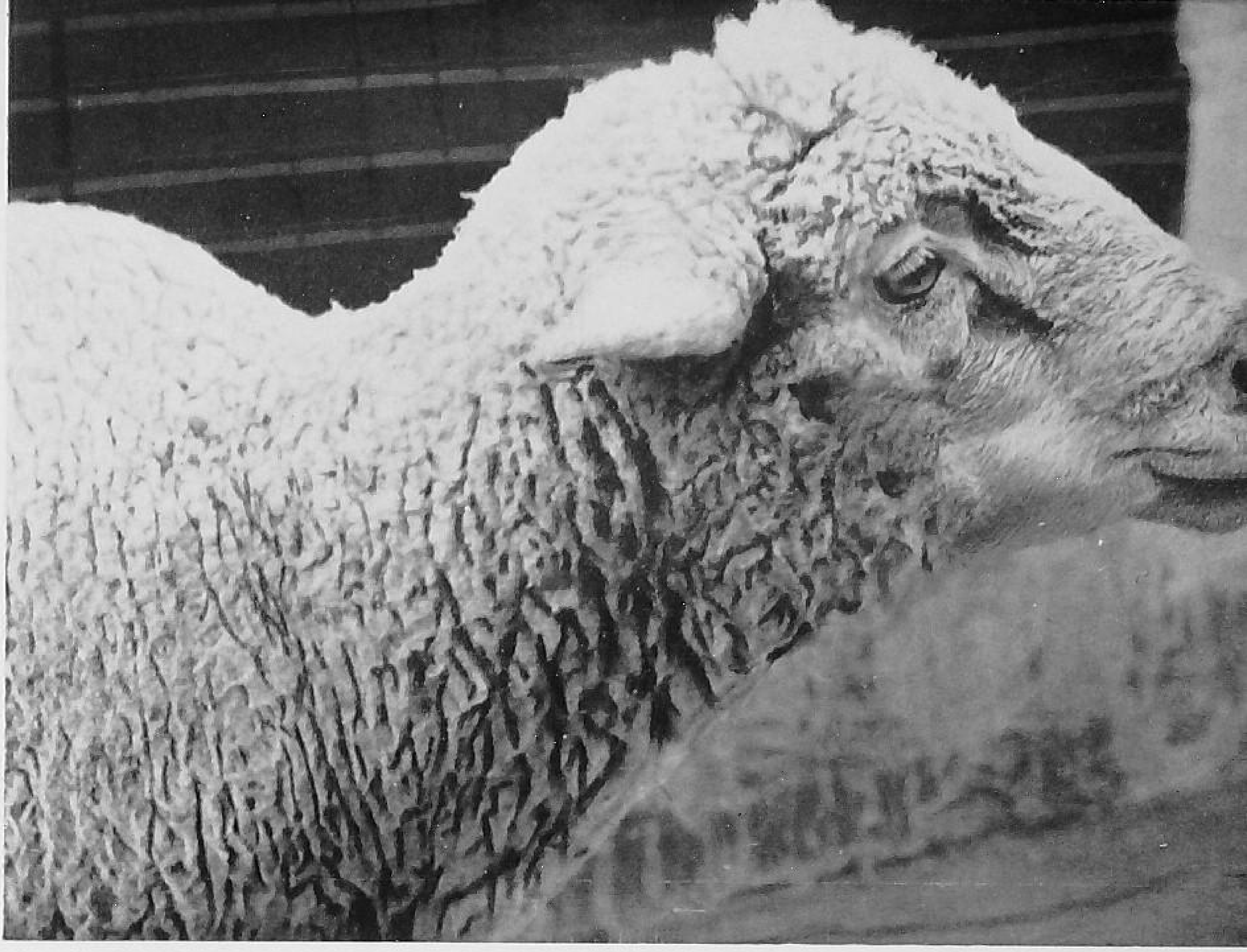
Sheep Husbandry

Sheep husbandry in Kangra district suits the migratory flocks only. The severe cold on the high ranges in winter, and the heavy rains in summer in the lower ranges make difficult for the flocks to remain stationary. So these flocks must shift grounds with the seasons.

The districts of Hissar, Ferozepore, Rohtak, and Karnal are not affected by seasonal variations. Here the problem is of pastures. Wherever good grazing and shelter are available, the sheep flock must shift. So the breeders are always in search of pastures for their flocks.

In other districts sheep husbandry is confined entirely to villages. There are no migratory flocks. They are in the hands of the zamindars or the Harijans or backward classes who keep them in twos, or threes or fours to meet their household needs for wool. They mostly live on stubbles after the harvesting of the *Rabi* or the *Kharif* crops. They have no pastures for them as intensive cultivation has made all the pasture lands and jungles disappear.

Sheep manure is very precious for the cultivators. It is the richest manure they can get. So in the Hariana tract, the migratory



Hissar dale sheep

A flock of Hissar dale sheep

Bikaneri sheep

flocks are often invited by the cultivators to fold on their lands, and in lieu thereof pay them cash and food.

Breeds and Breeders

The distinct breeds of sheep of the Punjab are (*i*) The Bikaneer (*ii*) The Lohi (*iii*) The Biangi and (*iv*) The Gaddis. The breeding of the Bikaneer is in the hands of the Hindu 'Odds' mostly, of the Lohi with the Rai Sikhs, of the Biangi with the hill people of Lahaul adjoining the Tibetan border, and of the Gaddi with the famous shepherds known as 'Gaddis'.

The Bikaneer is the best sheep in India so far as fineness of wool goes. It is the most compact animal, very hardy, and survives in all sorts of climates. However, it thrives well in the dry, hot and arid tracts. The ewes yield 4-6 lbs. of wool, and the rams 6-8 lbs. in two clippings in a year. The quality of mutton is also very good, and averages 20-30 seers per dressed carcase.

The Gaddi sheep survive only in hill areas. Their wool is inferior to the Bikaneer in fineness. The carcase is also much lighter in weight, and is inferior in quality. On an average the ewes yield 2-3 lbs. of wool and the rams 3-5 lbs. in two clippings every year.

The Biangi sheep is a much sturdier animal than the Gaddis. The yield of wool and mutton is also a little higher compared to the Gaddis. It thrives well on the higher ranges, and stands all climates, even the snow-fall of winter. The wool yield may be taken as 3-4 lbs. in the case of ewes and 4-6 lbs. in the case of rams annually.

The Lohi sheep has its real home in Pakistan in the so-called 'Thal' area covering a part of the districts of Multan, Montgomery, Jhang and Mianwali. It is the best type of mutton-sheep. Its fleece is almost all hair. It is also a good yielder of milk with very high percentage of fat—as much as 8 to 9%. The weight of the carcase, on an average, may be as much as 30-35 seers in good flocks.

The Bikaneer sheep may have a tan face, a white face or a black one. The rest of their bodies are spotlessly white. The Gaddis and the Biangi are all white. The Lohi sheep have long hanging ears, loppy with red colour; the face is also deep red. It

is often seen that this sheep possesses a rudimentary ear, a sign of good breeding, which is often called '*Parkanis.*'

Mating Seasons

The mating seasons are two in the year. The first season lasts from about the middle of March to the middle of April, and the 2nd from the beginning of September to the beginning of October. Consequently the lambing also takes place twice a year, with a pregnancy period of six months. The lambs are born usually in singles, but twins are also quite common. In the case of exceptionally fertile animals triplets are also met with. Quadruplets are also to be seen.

Breeding Operations

The rams should be given to the ewes only in the mating seasons, and when that season is over they should be segregated. It is best to split up a flock into families as that would ensure controlled breeding. The selection of a stud ram is of great importance. He should have an intelligent bold look in him. He should have a heavy massive body, the larger the surface of the body the greater the quantity of wool. The fleece should be of fine variety with as few hair as possible. Each family for breeding purposes must not be of more than 30 ewes.

Lambing

As is always necessary, sheep '*Baras*' should be situated on the uplands. The high grounds are much preferred. Each year these grounds should bo changed to avoid infestation of ticks, lice, mites and other skin parasites. The *Baras* should have enclosures of thorny bushes about 6-8 feet in height. The roof should be of thatch or *sarkanda.* On changing the place everything should be burnt and new material procured for building up new shelters. In a *Bara* there should be only one family. Every *Bara* should have a '*Nand*', a clay utensil to be used as watering trough, about one foot long and 8 inches wide with a depth of about 6 inches.

Clipping Seasons

The clipping seasons extend from the beginning of spring to autumn, and from September to middle of October, depending on the winter and summer rains and the temperature. Clipping is a great art. If done unmethodically, it spoils the fleece. The best portions of the fleece are those which do not touch the ground. So the wool from

Lohi sheep

A flock of Lohi sh

the feet, belly, and face should never be mixed up with that obtained from other parts. The sheep must also be washed before clipping to get clean white wool. There should be no *Bhindi* or *Pakhara* (fruits of some thorny bushes) sticking to the fleece. If the pasture land is full of these bushes, the fleece is bound to be affected. In that case these should be removed before clipping wool. The fleece with *Bhindi* or *Pakhara* carries very little value in the market.

Dipping

This process is very necessary, particularly in the case of big sheep flocks. Macdougall's sheep-dip powder is recommended for the purpose. It is available in the market, and could also be purchased from the Animal Husbandry Department, Punjab. Its application costs about 2 pice per animal. It gives lusture to fleece, stimulates growth of healthy wool, and kills all skin parasites.

Feeding

No doubt the sheep relishes grazing, but it is also fond of browsing. The *Niroo* grass of the higher ranges of the Kulu Valley and the *Khabal* grass of the plains are the best feeds for them. Similarly, leaves of the *Kokan Ber* (Zizyphus Nunnularia) are regarded good feed for it. The *Dhak* (Butea frondosa) leaves also offer good nourishing diet. In districts where there are no jungles or pasture lands, stubbles of wheat, barley and oats after the *Rabbi* harvesting and those of *Jowar* and maize following the *Kharif* harvesting, would serve the purpose. Green weeds in the fields are also very nourishing diet for them.

The ewes are never given any concentrates not even in the mating season, but all the stud rams get $\frac{1}{4}$ lbs. of coarse ground *channa* (gram) per day particularly when their coverings are heavy. Ewes are usually mated when they have 2 teeth, and the rams a little later so that they are fully mature. Their breeding span extends over about 5-6 years on the average.

Source of Stud Rams

The Animal Husbandry Department, Punjab, is catering for the improvement of two breeds of sheep in the Punjab—the Bikaner and the Lohi. For this purpose fine pedigreed basic flocks are being maintained at the Government Livestock Farm, Hissar. They are being bred and managed by an expert. A laboratory is also maintained for

tests on wool. Pedigreed rams are issued to the breeder in the field every year at concession rates. The Gaddis and the Lahaulies are very good breeders, and have already brought their flocks to perfection by skilful breeding.

Cross-breeding in Sheep

Cross-breeding of sheep is practised in all countries where sheep husbandry is at an advanced stage. To secure fineness of wool is the main object of cross-breeding. It is only the fine wool that has the best market. The "apparel wool" is the most prized variety. It fetches 2-3 times the price of wool of the Bikaneer sheep bred in India. The merinos of Australia and New Zealand are the best producers of this fine wool. Its export from these and other countries has, however, been banned totally.

With a view to producing apparel wool, the Punjab Government imported some merino rams from Australia and South Africa before the partition. They were crossed with the Bikaneer ewes, and after 4 crossings, 7/8 or 3/4 merino animals were evolved with fixed characters. Subsequent in-breeding amongst these cross-bred animals has further improved the flock. All their characters are fixed and there is no danger of reversion taking place. This newly evolved breed is known as the 'Hissar Dale'.

Cross-breeding Operations

To produce the apparel wool on mass scale, it has recently been decided to cross all types of sheep (except the Lohi) with the Hissar Dales. The tracts chosen are the Bikaneer of Hissar and Ferozepore Districts, the Gaddi of Kangra District, and the Biangi of Lahaul and the Tibet border. These flocks need no grading-up further. Crossings are to be done either by natural service of rams or by means of artificial insemination, or both, according to facilities available in each tract. The object is to make these local sheep almost pure Hissar Dales by 4-5 successive crossings. This cross breeding would bring lot of money to flock owners, and make available large stocks of apparel wool to the country for the manufacture of fine woollen cloth.

It is also proposed now to import some Corriodale sheep from Australia or New Zealand for cross-breeding with indigenous sheep. These Corriodales are rather coarser compared to the

Merinos, but would serve the purpose when merinos cannot be had from anywhere.

Castrations

If any headway is to be made in cross-breeding it is very necessary to remove all the local rams from the flocks. The only way to do it is to castrate them as soon as they are of the covering age. Similarly in the districts where grading up of flocks is going on, all inferior rams must be castrated.

Wool Industry

The districts which produce the largest quantity of wool are: Kangra, Ferozepore, Hissar, Rohtak, Karnal and Amritsar. Special attention should be given to improving the stock in these districts, as that would solve the problem of finding apparel wool for meeting requirements of the State. The rest of the districts could continue to supply what is known as 'carpet wool' both for home consumption and for export abroad. Machinery for the spinning of fine wool has already been evolved indigenously, and could be purchased at reasonable price through the Animal Husbandry Department or Department of Industries, Punjab.

Wool Markets in Punjab

There are two big wool markets in the Punjab from where thousands of bales of wool are exported every year. These are at Fazilka and Panipat. Fazilka is regarded as the biggest market in Northern India.

CHAPTER 32

FISHERIES

There is a large number of ponds and tanks in the State which if properly controlled and shaped can be turned into a very good source of fish and would yield rich dividends to those who own them. These ponds and tanks can be stocked with fry of fish which on growing to the marketable size, can be sold at a handsome profit. "There is more gold in water than on land," is a saying which aptly summarises the prospects in this field. Besides, the dietetic value of fish is much superior to that of meat. It is rich in proteins, minerals, and valuable oils. More extensive use of fish as a principal article of diet is highly advisable particularly for children, pregnant women and nursing mothers whose need for calcium is great.

Important Species in Punjab

Different types of fish are found in different tracts of the Punjab. In the hills in snow-fed streams trout prospers, in sub-montane areas is found *Mahseer* (Barbes Tor), and in the plains carp, cat fish and *Murrel* grow well. The cat fish, *e.g.*, *Mulee*, *Singharee*, *Khagga* and *Bachwa*, and the *Murrel*, *e.g.*, *Saul*, *Sauli* and *Daula*, are carnivorons These prey upon their young ones, and the bigger ones prey on the smaller. They are not suitable for pisciculture, and are not recommended for stocking in ponds.

The carp, *e.g.*, *Thaila* (Catla Catla) *Rohu* (Labero Rohita) and *Mori* (Cirrhina Mirgala), is herbivorous and is good for cultivation in ponds and tanks. These varieties can be identified easily by the absence of teeth in their mouth and presence of pharyngeal teeth, and coat of scales (the head above is scaleless). The carp does not breed in confined waters, and so tanks have to be stocked with fry, periodically collected and brought from their spawning grounds.

Best Varieties of Fishes

Best varieties of fishes are *Trout*, *Mahseer* (Barbus Tor), *Thaila* (Catla Catla), *Rohu* (Labero Rohita) and *Mori* (Cirrhina Mirgala) because they possess rich and tasty flesh, and are relished very much. Some people like *Mullee*, *Sigharee*, and *Saul* also because of their being less bony than the former species.

Trouts from the Government Fisheries, Katrain

Schemes of Pisciculture

The scheme of stocking with fish fry all the suitable ponds and tanks in the State is in the hands of the Fisheries Department but only little work has been done for want of funds and transport facilities. Lists of ponds and tanks and other impounded waters in each district have been prepared after extensive survey.

The search for spawning grounds is also under way. Spawning grounds or fry collecting centres are located just after the floods because during heavy floods in rivers and streams in July and August spawning takes place. Fish ascend to the upper reaches of streams and rivers, and lay eggs in shallow pits inside waters wherefrom they return to the main stream leaving their eggs to hatch out. Thus fry are available in these centres, which should be located for making fry collections by means of small meshed nets. The fry may be collected in open fish-carriers for carrying to short distances, and in oxygen carriers for far off places, and transported to impounded waters, called the fish farms.

Suitability of Waters

Any type of pond, *kacha* or *pucca*, can be turned into a 'fish farm' provided it contains water at least 3-4 feet deep all the year round or can be fed with water from canal, well, or other sources in case of drought.

Before introducing fish into a tank, it must be cleared of the fish enemies *i.e.*, cat fishes, murrel, frogs, snakes and tortoises. Even water beetles may injure the tiny fry. Tender water plants, *e.g.*, *Hydrilla*, *Pota-mageton*, *Panna*, *Kalmi* and *Suk* should be grown as they serve as food for the fry and provide shade and shelter to them.

The water should be impounded beyond the reach of all floods from streams or rivers. In fish farming the soil plays an important part, *i.e.*, an acidic soil is less productive than an alkaline soil. The pond can be manured with cow dung and dead leaves to produce more food for fish in the pond. This will give a bumper crop as the growth of fish depends on the food in water.

Production and Disposal of Fish

An acre of pond can be stocked generally with 2 to 3 thousand carp fry (young fish) every year depending on the food available in it. It has been found that about half the population introduced into a tank survives. The survival of the fittest is the basic law of nature. The

weakest succumb to natural calamities in the struggle for existence. Also a large number is eaten up by birds and frogs.

After 3 years the pond should produce not less than 1500 seers of fish, which if sold at the rate of Re. 1 per seer would give an income of Rs. 1,500. Fry should be introduced every year for continuous propagation.

Full account of the following should be maintained at each Fish Farm.

(*i*) Fry collected (Number)
(*ii*) Percentage of mortality in transport
(*iii*) No. of fry stocked
(*iv*) Fish taken out in number, and weight
(*v*) Expenditure
(*vi*) Income

The account should definitely show whether the Farm is productive or not. If non-productive, steps should be taken to remove the defects by manuring and other suitable means. The fish can be sent to the nearest fish market for sale, but rates of different fish markets should be kept in view to select the most profitable market. If possible the fish should be sold on the spot. This is more advantageous as it saves dryage and loss in weight.

Targets

Exact or even approximate figures of probable expenditure cannot be given because variations in it are very wide due to the following reasons :

(*i*) The pond to be stocked may be too far away or very near the Seed Farm.

(*ii*) The watch and ward arrangements on the pond may not be needed.

(*iii*) Cost on supply of water to the pond may or may not have to be met.

It can, however, be said with certainty that pisciculture is a paying job. Expense on stocking costs about Rs. 5 to Rs. 10 per hundred fry depending on the distance of the pond to be stocked from the seed farm or fry collecting centre, and mode of transport employed.

Useful instructions

Out of the carp, *Thaila* (Catla Catla) takes its food from the upper zone of the water, and is surface feeder, *Rohu* (Labeo Rohita) is a middle of feeder, and *Mori* (Cirrhira Mirgala) bottom feeder. So all the three species of Carp *i.e.*, *Thaila*, *Rohu* and *Mori* should be introduced into a pond simultaneously to make the best use of the entire food in the water.

The fish farm selected for pisciculture should be thoroughly netted and all predaceous fish removed before any stocking is done.

Bottom of the farm should be thoroughly stirred with bamboos having iron pegs 4″ long to remove heavy poisonous gases.

Precautions

(*i*) The Farm must contain 3-4 feet deep water all the year round.

(*ii*) Before the fry are put in the farm, the temperature of the water of the fry-container should be equalised to that of the water in the Fish Farm ; otherwise the sudden change in temperature will cause mortality amongst the fry.

(*iii*) In the fry collecting centres, fry of different kinds of fish are found. Only the fry of *Carp* should be collected after carefully sorting out different species. This is, of course, a difficult job, but for it help of officials of the Fisheries Department can always be sought. They can give all technical advice in this respect.

There is an Assistant Warden of Fisheries in each District with a number of other subordinate employees under him who would give all help to those who take to pisciculture.

Fry Trade

Fry of *Carp* may be collected from the spawning grounds in earthen vessels and kept in pits near homesteads for sale to those who want to stock their ponds with fish.

In Bengal Fry trade is popular, and is carried on a large scale. In the Punjab, too, this can be easily done if people become fish-minded. Any further advice regarding pisciculture and fry trade can be obtained from the Assistant Warden of Fisheries of a district.

CHAPTER 33

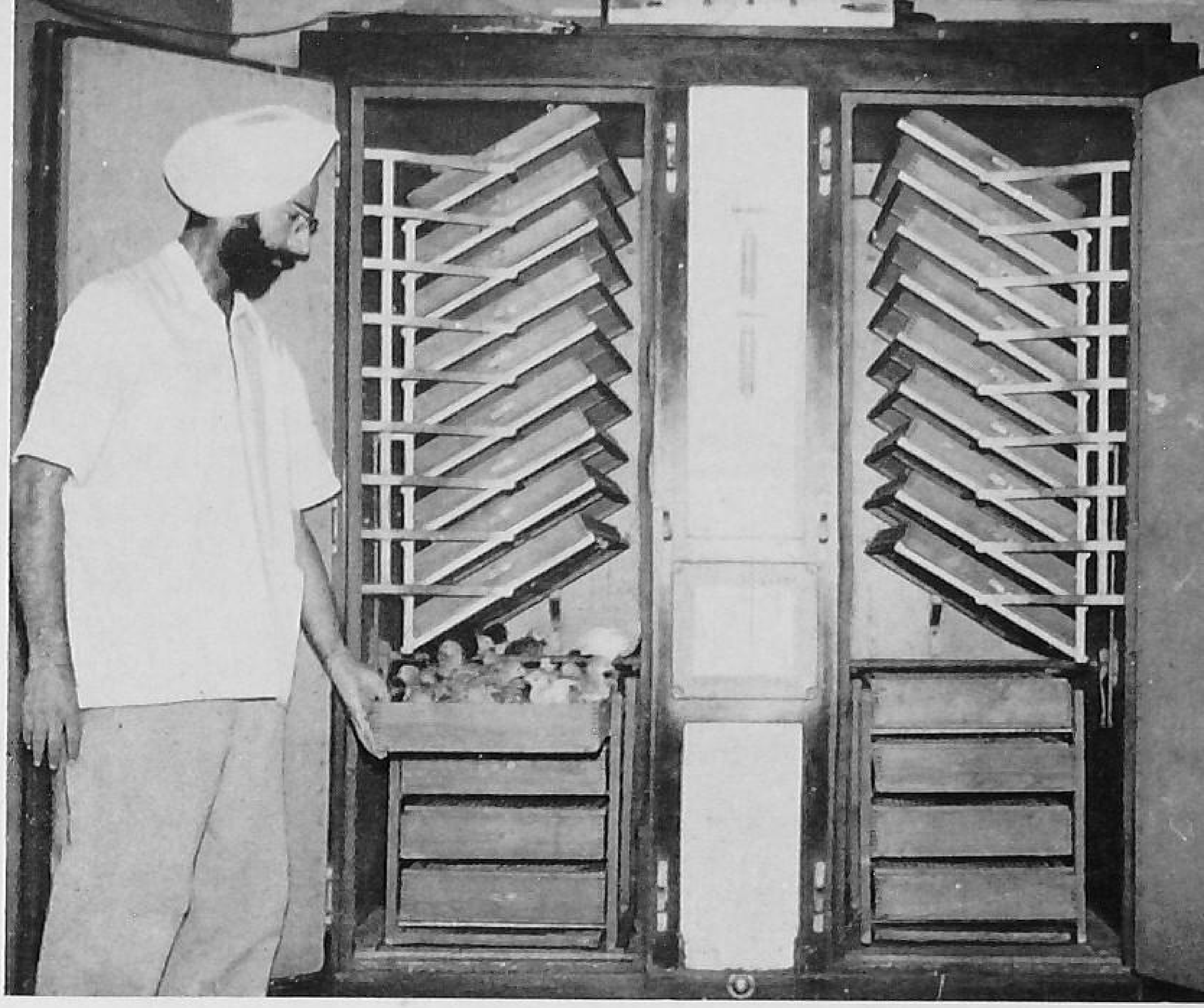
POULTRY

It is an admitted fact that poultry and poultry products have a very high nutritive value as food. The Punjab is, however, still backward in the poultry industry. According to the census held in May 1945, the State had 8,88,000 poultry birds (1.5 % of the total in India) as against 64,49,000 in West Bengal, 59,16,000 in Bihar, 14,775 in Madras, and 47,48,000 in Bombay. In 1951, when the last Census took place, the number of birds in the Punjab stood at 8,97,845 showing a slight increase over the last six years. In view of the importance of poultry products, this industry needs careful planning. There is no better cottage and subsidiary industry than poultry farming for cultivators and other villagers; and there is great scope for its development. A farmer by investing a small sum in and giving a little time and attention to poultry rearing can supplement his income in considerable measure.

At present poultry keeping in villages is confined mostly to backward classes. The birds are usually of non-descript type, laying about 40-50 eggs of small size annually, compared to 120-150 eggs of much larger size of the important breeds. The marketing of eggs and birds through small middlemen is another discouraging factor. The Punjab Government has recently taken steps to develop the poultry industry in a well planned manner; and beginning has been made in the Community Projects and National Extension Service Blocks.

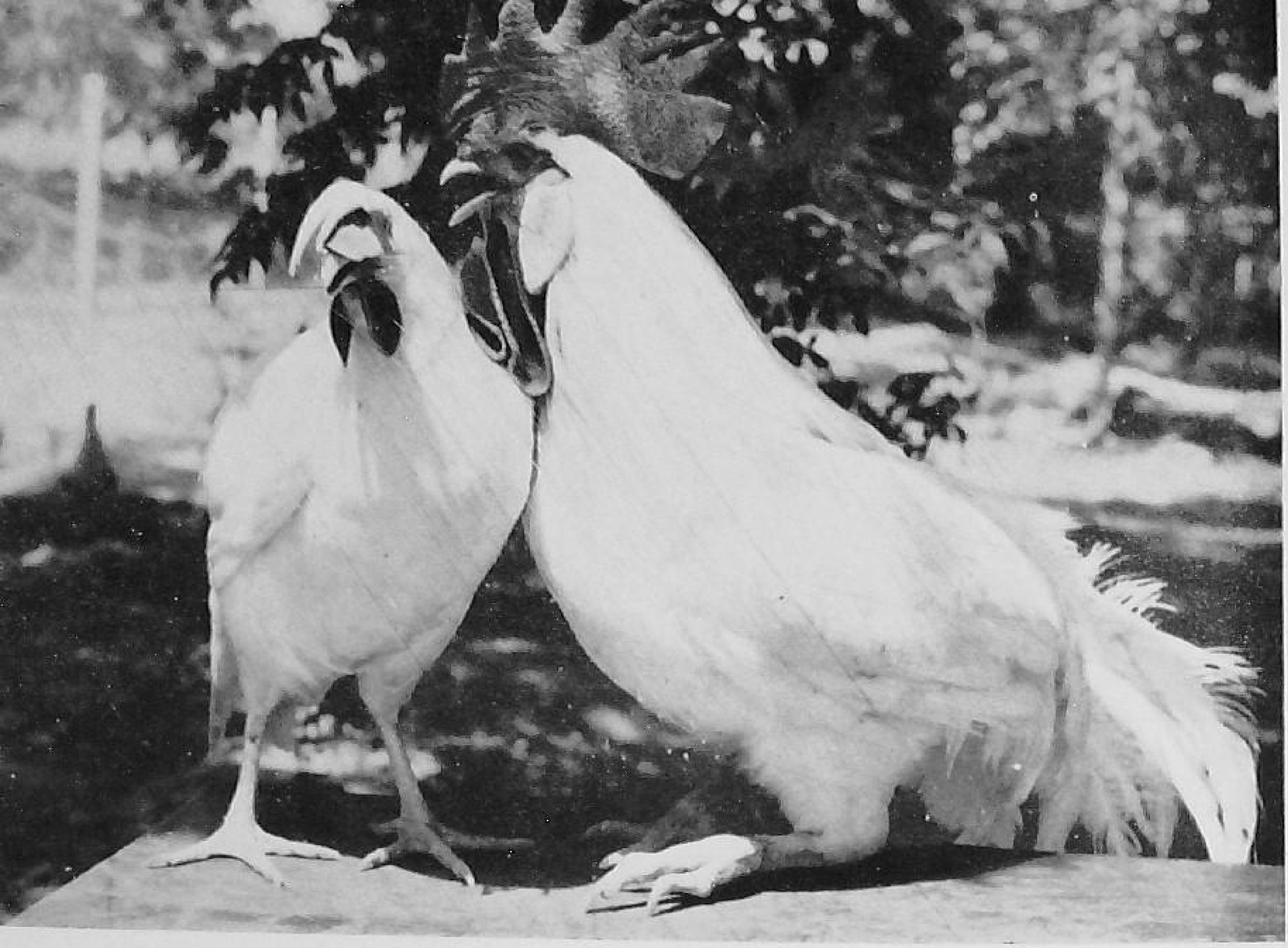
Departmental Organization

The Departmental Organisation consists of a Central Government Poultry Farm at Gurdaspur with three sub-stations located at Jullundur, Ambala and Kangra. The Gurdaspur Poultry Farm is the only Breeding Farm in the Punjab supplying hatching eggs and poultry birds of improved varieties to the people in the State, as also to the adjoining States of PEPSU, Himachal Pradesh, and Jammu and Kashmir. Mainly, the White Leghorn and the Rhode Island Red breeds are maintained at the Gurdaspur Farm and its three sub stations, but



The Brooder

Inoculation of poultry in Community ar



White Leg-horns

The Foster Mother

during 1952-53, two new breeds viz. *Black Minorca* and *Barred Plymouth Rock*, were also introduced on the Farm as an experimental measure.

The total strength of the birds including chickens at the Central Farm and its sub-stations on the 31st March 1954 was 6722. The total egg production was 62481, out of which 18616 eggs were used for incubation and 34049 sold to the public for hatching and table purposes.

The Punjab Government have sanctioned a scheme for the extension of poultry farming in the State by enlarging the Poultry Farm at Gurdaspur and by replacing *desi* birds in the Community Project Areas and National Extension Service Scheme Blocks with those of the White Leghorn and Rhode Island Red varieties side by side, all the birds are being systematically protected against deadly disease, like the Ranikhet and the Fowl Cholera. Since the inception of the Scheme, poultry industry is growing in popularity and small-scale poultry farms are springing up in large numbers. A six weeks' training course in Poultry Farming for combined Civil and Military personnel from all over Punjab, PEPSU, Himachal Pradesh, and Jammu and Kashmir has also been started.

The hints given below would be found useful by all those interested in poultry keeping.

Selection of Site

Before any attempt is made to start poultry breeding, the first consideration must be with regard to the location of the farm. The ideal site is that which is well protected and sheltered in summer as well as winter. There should be no likelihood of the ground being water-logged during the rainy season. The site should not be low-lying or barren. If possible it should be away from crowded areas, thus avoiding outbreak of diseases brought by traffic. Proximity to a railway station or road for transport facilities is another consideration to be kept in view when selecting the site.

Soil is the next important factor in the matter. Soil containing salt-petre must be avoided. Heavy clay soil is not suitable as it does not permit the droppings of the birds to wash through, and thus harbours the eggs of poultry parasites. The soft soil should also be avoided. The ideal soil is the light sandy loam as it

provides clean surroundings and permits the droppings to wash through.

Selection of Breed

Of the various foreign breeds, the White Leghorn and the Rhode Island Red varieties have been found to thrive best in the Punjab. When egg production is the chief consideration, White Leghorns should be the choice. But for meat and eggs both, the dual purpose breed of Rhode Island Red is usually favoured. From the point of view of climate, the White Leghorn is suited best to districts of the Ambala Division and the Rhode Island Red to districts in Jullundur Division.

Selection of Birds for Breeding

In order to avoid mortality at a later stage, it is essential that a start should be made with a vigorous and healthy stock. A vigorous fowl has bright and prominent eyes, comb and wattle of good texture and colour, rather deep broad head, and relatively deep and reasonably fleshy but not excessively fat body. Birds with low vitality have dull sunken eyes, very fine or coarse comb, and wattle and small bodies. They should not be selected for breeding.

Production of Hatching Eggs

Eggs for hatching should only be saved from those of healthy hens. These should be uniform in shape, size, and colour, weighing two ounces each, and should have sound shells. Nesting material and litter should be kept clean and dry to prevent eggs from getting dirty. Sufficient saw-dust or dry grass should be provided in the laying nests to prevent breakage of eggs. Crushed oyster shells or lime stones should be kept before the laying birds at all times to provide calcium to them so that they produce eggs with shells that will not crack easily. Fresh green feeds and animal proteins should be fed to such stock. It is advisable to mate the breeding stock ten days before the eggs are used for hatching. One male is generally enough for about ten to fifteen females. Hatching eggs should be gathered frequently and kept in well ventilated place at a temperature of 50° to 60° F. The eggs meant for hatching should not be kept for more than 10 days in winter and seven days in summer and autum after laying.

An egg takes about 21 days to hatch provided it is properly incubated. Incubation may be natural or artificial.

Incubation

Natural incubation *i.e.*, incubation of eggs under hens may be adopted when the number of chicks to be raised is small. A good hen can hatch from 10 to 12 eggs at a time.

When a relatively large number of eggs is to be hatched, it is necessary to use an artificial incubator, or purchase one day old chicks from Govt. Poultry Farm where such facilities are available. In addition to a large-sized incubator already available at the Govt. Poultry Farm, Gurdaspur, two new mammoth sized incubators have been purchased recently for installing one at Gurdaspur and the other at the Ambala Sub Station. Incubators are heated by either kerosene oil or electricity. Electric energy is more dependable and cheap. Recommendations of the manufacturers of incubators should be strictly followed to obtain the best results.

Best Period for Hatching

If chickens are hatched just prior to or during high temperature periods, they are likely to develop slowly. But when they are hatched too early in the year, they may mature at a normal rate, lay for a month or so, and then stop laying altogether. Thus there is a loss of several weeks of egg production. Under the Punjab climatic conditions, the period, starting from February to the middle of April, seems to be the most suitable for hatching. In order to produce 100 chicks about 200 eggs of good quality would be required.

Brooding

After incubation, the next stage is the rearing of chickens. Those incubated under natural conditions are generally looked after well by the hens. But when large numbers of chickens are hatched in big incubators artificial rearing has to be resorted to. The quality of stock will depend on the quality of chickens and the conditions under which they are brought up. When resorting to artificial rearing, the following points should be borne in mind.

(*a*) Provision of correct amount of feed at all times.
(*b*) Provision of properly balanced ration containing animal and vegetable substances and vitamins.
(*c*) Light and ventilation.
(*d*) Cleanliness.
(*e*) Protection from insects, lice and mites.
(*f*) Proper temperature.

Chickens are normally reared under artificial conditions for 6 to 8 weeks. The machine called the "foster mother" must be tested for one or two days to ensure proper working before they are put in it. The temperature should be about 95° F 2 inches above the floor level. This temperature should be decreased by five degrees daily until it is 80° F. During the first few days the chickens need some encouragement to leave the "foster mother" but later on they will find their own way out.

Light breed chickens required 7 to 10 square inches of floor area each under the "foster mother," and the heavy breed need 10 to 12 square inches. Over-crowding hinders growth and increases mortality. The brooder rooms should have a minimum of 50 square feet of floor area per hundred chickens.

Rearing of Young Stock

After the brooding period is over, it is preferable to use the simple structure commonly called the 'Range.' Its advantages are that it has a wire netting floor area which will allow dropping to fall in the pit below. It is easy to clean and can be moved from place to place thereby manuring the fields without any cost.

Housing

The following points may be kept in view while constructing a poultry house.

(*i*) It should be comfortable for the birds.
(*ii*) While elaborate arrangements should be avoided, a very cheap house should not be chosen.
(*iii*) The house should be such as can be easily disinfected.

Nests

Well-ventilated nests at the rate of one for six are required for layers. The bottom of the nest should be made of wood or wire netting of half inch mesh, which should be kept well padded with soft bedding to prevent breaking of eggs.

Feeding

Chickens should be fed as soon as they are placed in the brooders. They may be fed on mash four times a day for the first two to three weeks and three times thereafter. A little dry mash should always be kept before them. After about the fourth week fine scratch grain may be added to mash—one part to nine parts. The proportion of grain in

mash should be increased gradually until they eat about equal parts of grain and mash at ten to twelve weeks of age. The following mixtures are recommended :

Scratch grain for feeding upto 3 months

Maize crushed	1 part
Bajra	1 part

Mash

Wheat bran	15 parts
Maize flour	35 parts
Barley	20 parts
Nut cakes	25 parts
Fish meal	5 parts
Limestone or oyster shell common salt	1 part

Meat offal can be used in place of fish meal. Chickens should be allowed access to sun, or one per cent shark liver oil (Veterinary) may be added to the mash. Green vegetables etc. should also be given freely. Separated milk, butter milk, or water should be available at all times.

Feeding for Egg Production

The laying stock should have access to grit, oyster shells or limestones at all times. Dry mash should be kept in hoppers all the time. Wet mash should be fed once daily, but be limited to such quantity as will be consumed in 15 to 20 minutes. Green stuff like Berseem, green grasses, and vegetable leaves should be given at the rate of one to two ounces per head.

Amount of food required	*Gram*	*Mash*	*Green things*
Adults (above 6 months)	1 Chh.	1 Chh.	1/2 to 1 Ch.
Chickens of five to six months.	2 oz.	1 oz.	1 oz.
,, ,, four to five months	1½ oz.	1½ oz.	1 oz.
,, ,, three to four months	1 oz.	1½ oz.	½ oz.
,, ,, two to three months	1 oz.	1 oz.	1½ oz.
,, ,, one to two months	½ oz.	½ oz.	¼ oz.

It is very important that laying hens should have plenty of clean and wholesome water at all times. Water is essential for production of eggs. An automatic watering device is very useful and economical too. Take an ordinary earthen pitcher and make a

small hole in its neck. Fill the pitcher with cold water and put it up-side down in an earthen dish (*Kunali.*) This water would be enough for 10-15 birds for the whole day. During hot weather, water should be placed in shade.

Care of Eggs

Eggs should be removed frequently from the laying nests to prevent soilage and breakage. Clean eggs attract customers. Washing is not only laborious but also removes the protective covering thereby reducing natural preservation. Eggs are spoilt quickly under high temperature. Cold temperature preserves and lengthens the life. In summer months, they should be kept in cold and humid place. Since fertile eggs are spoilt more quickly than infertile eggs, all males should be kept away from the laying stock during hot summer months unless the eggs are required for hatching purposes.

Preservation of Eggs

The main factors causing deterioration of eggs are:

(*i*) High temperature

(*ii*) Low humidity

(*iii*) Keeping for long periods

(*iv*) Constant fertilization

The last factor can be controlled by removal of males from the flock after the breeding season is over. Infertile eggs can be kept for much longer periods without deterioration than the fertile ones. Eggs can be preserved by storing them in coolers or cold storages. This is a costly method of preservation, and cannot be practised in villages. Eggs should be used as early as possible or at the most within 3-4 days after they have been taken out from the coolers. Other methods of preservation are discussed below:

The Water Glass Method: Make a water glass solution by adding one part of sodium silicate to 9 parts of boiled water. Cover the eggs with the solution. About 2½ gallons of solution will be sufficient for 15 dozens of eggs. An ordinary '*Chatti*' or earthen pot is quite useful for storing purposes. Evaporation should be avoided by putting a layer of mineral oil over the top of the solution. Place eggs after treatment with small ends downwards. Cover the container with a piece of cloth or paper to keep dust out. Keep the container in a cool place.

Oil Treatment Method: It has been shown that eggs coated with a layer of oil can be kept in excellent condition for 3 to 5 months. Dip the eggs in oil at 80-90 degrees F for a few seconds by placing them in baskets made of wire. Drain them to remove excess of oil. Store them in cool place with small ends downwards. However, eggs preserved by this method cannot be called fresh eggs.

Thermo-Stabilization: Immerse the eggs in a hot water bath at a temperature of 105 degrees F for 15 minutes. Before storing them they may preferably be oiled, which besides preserving them prevents loss of weight through evaporation. Eggs treated in this way can be kept for about 3 weeks.

Disease Control

Diseases and parasites can play havoc in a poultry flock causing high mortality, low egg yield, and stunted growth amongst the survivors. The prevention and control of diseases and parasites is, therefore, of foremost importance for successful poultry farming. There are probably more failures in poultry business on account of high mortality than due to any other reason. Successful poultry farms are generally those which are free from diseases and parasites.

By the time a disease is detected much damage has already been done. There are certain diseases which are incurable, *e.g.*, Ranikhet which is the most common deadly disease of poultry. Although there is no cure for Ranikhet, it can be prevented by prophylactic vaccination of the flock. Similarly chicken pox though not very common still causes severe losses through mortality and decrease in egg production. In areas where this disease is common chickens should be vaccinated when they are 2-3 months old.

A system of land rotation is of great value in the control of internal worms. It also helps in keeping other diseases under control. Usually diseases or parasites are introduced into a flock of healthy birds through purchase of new ones which happen to be infected. It is advisable to quarantine all newly purchased birds for about 14 days. At the slightest sign of any disease or infection appearing in a flock, it is always advisable to contact the nearest Veterinary Assistant Surgeon for treatment and guidance. However, the following basic factors should be observed for prevention and control of diseases:

(1) Healthy and disease-free chickens from selected parents should be purchased for breeding.

(2) Vaccination against Fowl Pox and Ranikhet diseases at 8 and 12 weeks of age respectively should be done.

(3) Grow pullets on clean range not used previously.

(4) Raise young chickens entirely separate from old stock.

(5) Avoid infection from outside.

(6) Feed well-balanced ration for the prevention of nutritional diseases.

(7) Control external parasites, *e.g.*, lice, mice, ticks etc., by using reliable insecticides like D.D.T. Powder.

(8) Do not allow visitors in poultry houses, pens and feed rooms.

(9) Remove now and then weak and undesirable birds from the flock.

(10) Dispose off diseased dead birds properly.

CHAPTER 34

BEE-KEEPING

India is the native home of the honey-bee, and the species now known as the "hive bee" seems to have migrated, centuries ago, from Asia to Africa and Europe. Early European emigrants introduced it into America. Its introduction in Australia and New-zealand is much more recent. Although India is the home of the honey-bee, and the use of honey and beeswax is known to the people from ancient times, yet bee culture has not received the desired attention. On the contrary, countries like America, Australia and Newzealand have made great strides in the development of bee industry and are exporting honey in large quantity to India and other countries. It is, however, hoped that under the National Extension Scheme bee-culture will receive an impetus.

The bees are a great friend of the farmer, and they render a most valuable help in the production of agricultural crops through pollination, and without their help, many species of plants will not set seed or produce fruits, no matter how well they are cultivated, manured and protected from pests and diseases. Honey and bees-wax are merely the bye-products of pollination. Some of the agricultural crops, which depend on honey-bees for pollination, or yield more abundantly when bees are plentiful, are listed below:

Fruits : Apples, apricots, cherries, grapes, peaches, pears, plums, persimmons, pomegranates, papayas, *jaman*, *falsa*, dates, citrus fruits, black-berries, cran-berries, straw-berries, etc.

Vegetables : Cabbage, cauliflower, onion, turnip, melon, radish, knol kohl, pumpkins, cucumbers, *tindas*, etc.

Fodders : Berseem, *shaftal*, lucern, etc.

Oilseeds : *Toria, sarson, raya, rai, etc.*

(a) **Honey :** Honey is a highly nutritive food and a most important source of heat and energy for the human system. It is

composed of quickly assimilable sugars, and such minerals as are necessary for a balanced diet and for tired and over-worked persons, it is a restorative par excellence. Its use as medicine has been recognised in India since the Vedic age, and it is extensively used in many Ayurvedic prescriptions.

Importance of Bye-products

(b) **Bees-wax:** It is used in the preparation of furniture, floor and boot polishes, varnish oils, lubricants, ointments, cosmetics, electric insulating apparatus and in modelling and plastic works as well as for water-proofing surfaces of aeroplanes. It is also used for making candles and comb-foundations for bee-hives.

How to Make a Start

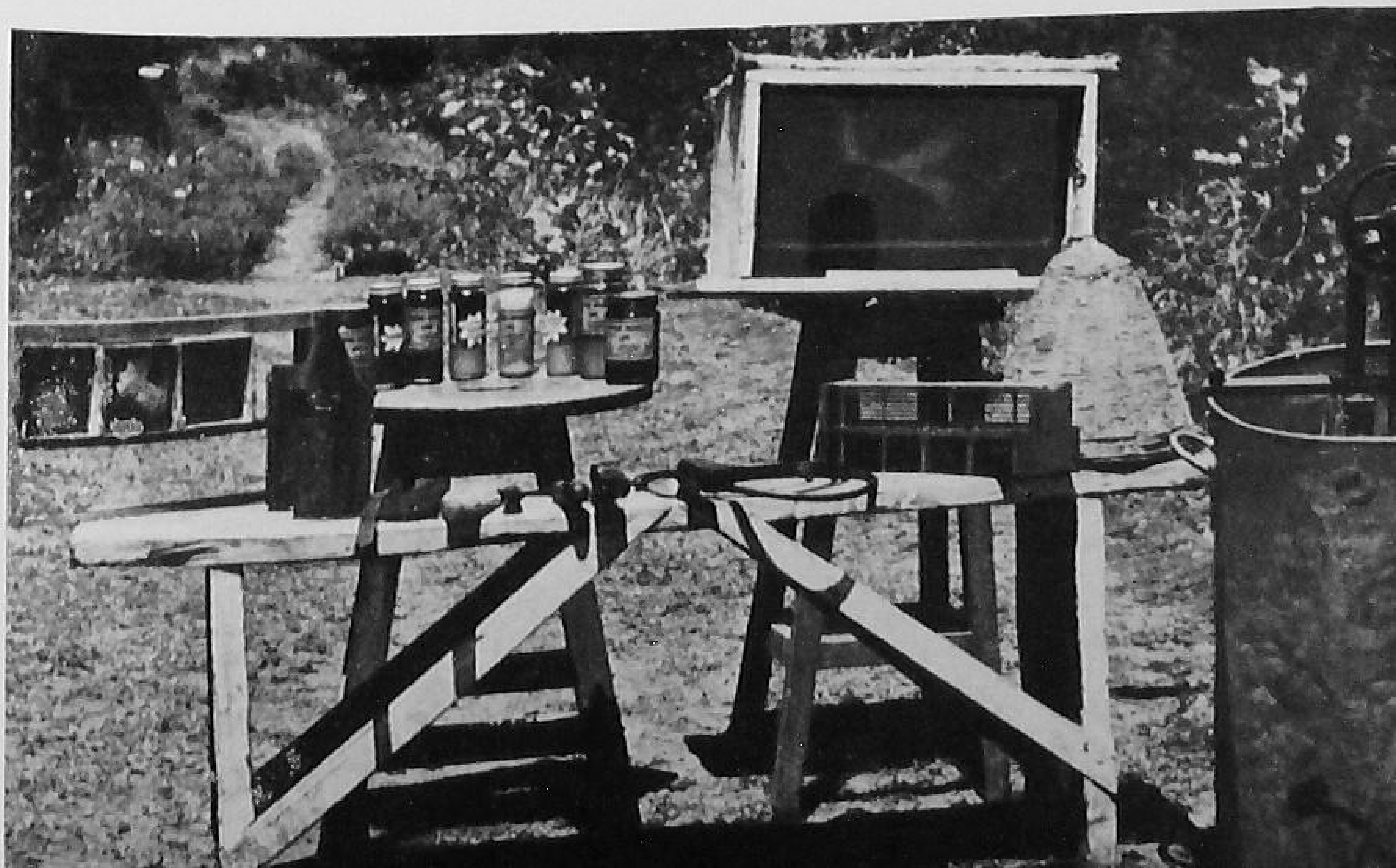
Beekeeping at the present stage of progress of the industry can be practised as a side line or cottage industry, and a start in the craft has to be made intelligently. Any person with real interest in bees, having power of observation, and who is not greatly affected by bee-sting, can become an efficient beekeeper. School teachers, clerks, priests, retired government officers, businessmen, petty shopkeepers, in addition to farmers, can profitably take up beekeeping. Training in the art is essential and can be had at the Government Bee-farms of the Agriculture Department. In addition, the study of the following literature is recommended :

1. Beekeeping by C.C. Ghosh	Miscellaneous Bulletin No. 6 of the Indian Council of Agricultural Research, New Delhi.
2. Beekeeping in South India by S. Rama Chandran	Government Press, Madras.
3. The Romance of Romance Beekeeping	Dass Gupta, Khadi Pratisthan, 15, College Square, Calcutta.
4. Madhu Makhi Palan (Hindi)	Dya Ram Jugran, Vigyan Prashad, Allahabad.
5. Beekeeping by E.P. Phillips.	Macmillan & Co. Bombay.
6. A.B.C. & X.Y.Z. of Bee-culture	E. R. Root, D. B. Torapore-wala and Sons Ltd., Bombay.

Regular subscription to the *Indian Bee Journal* Ramgarh (Nainital), U.P. is sure to benefit the readers.

A new model of wall-hive

Honey is ready for the market



To begin with, the start may be made with 3 to 4 colonies of bees, and the work extended gradually, according to the success obtained.

Which Bees to keep

Three kinds of honey-bees, *viz.*, "*Chhoti Makhi*" (*Apis* flora F.) "Dumna" (*Apis dorsata* F.) and "*Darohla*" (*Apis* indica F.-hill variety) are found in the Punjab. "*Chhoti Makhi*" is a resident of the plains while "*Dumna*" lives in sub-montane tracts, from where it keeps migrating to plains and lower hills upto an altitude of 5,000 feet. "*Chhoti Makhi*" yields only about a pound of honey per colony and is not economical for domestication. "*Dumna*" is a very good honey gatherer. Its colonies are known to yield upto one maund of honey per colony, but they are of a most ferocious and vicious temperament and do not brook disturbance. Because of these reasons, both these types are unfit for keeping in modern hives.

Apis indica F. hill variety—as its name signifies, is a permanent resident of the hills and is found in Kangra and Simla districts. Its stray colonies are also met within Pathankot Tehsil (Gurdaspur Distt.) and Una Tahsil (Hoshiarpur Distt.). It has a docile temperament. It builds several parallel combs in covered and protected recesses, and is best suited for honey production.

Where to keep Bees

The natural distribution of Apis indica F. in the Punjab limits beekeeping industry to the hilly tracts only from 1000 to 10,000 feet above sea-level. Kangra and Kulu Valleys are particularly suitable for the production of good quality honey. Kulu Valley is particularly suitable. The following honey flora should be available in abundance within one and a half miles radius of the apiary:

Trees: *Shisham*, *Toon*, *Darral*, Soap-nut, *Arjan*, *Jaman*, *Kharhamb*, *Punna*, and all kinds of fruit trees.

Crops: *Sarson*, *toria*, *raya*, berseem, *shaftal*, radish, maize, *bajra*, buckwheat, cabbage, cauliflower, turnip, etc.

Bushes & Weeds: Bar-berry, wild berry, wild rose, wild white clover, wild *isafgol*, *shain*, *dudli* (Dandelion).

Ornamentals: Cosmos, Portulaca, Roses, Lagerstroemia, Golden rod, Poinsettia, Antigonon, Honey-sukle, Corn flower, Coreopsis.

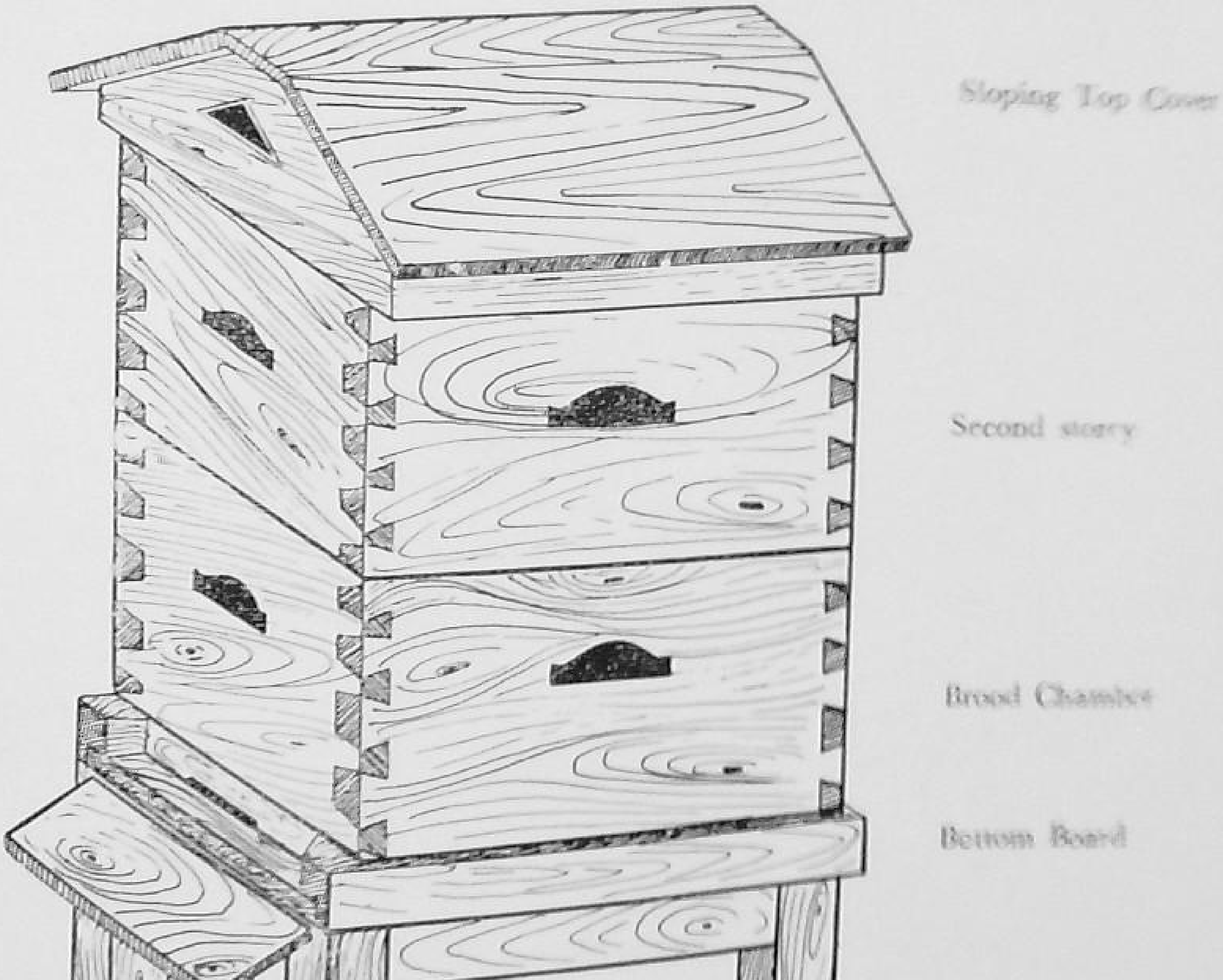
The mere presence of a few trees or ornamentals or a small garden of one or two acres cannot make a locality fit for the successful prosecution of bee-culture. Huge numbers of the above-mentioned trees or bushes on large areas under the above-noted crops or ornamentals are essential, and a thorough knowledge of the bee flora of any particular locality is the first pre-requisite for the success of this cottage industry.

Bees, modern bee-hives, comb foundation and other necessary bee appliances can be obtained from:

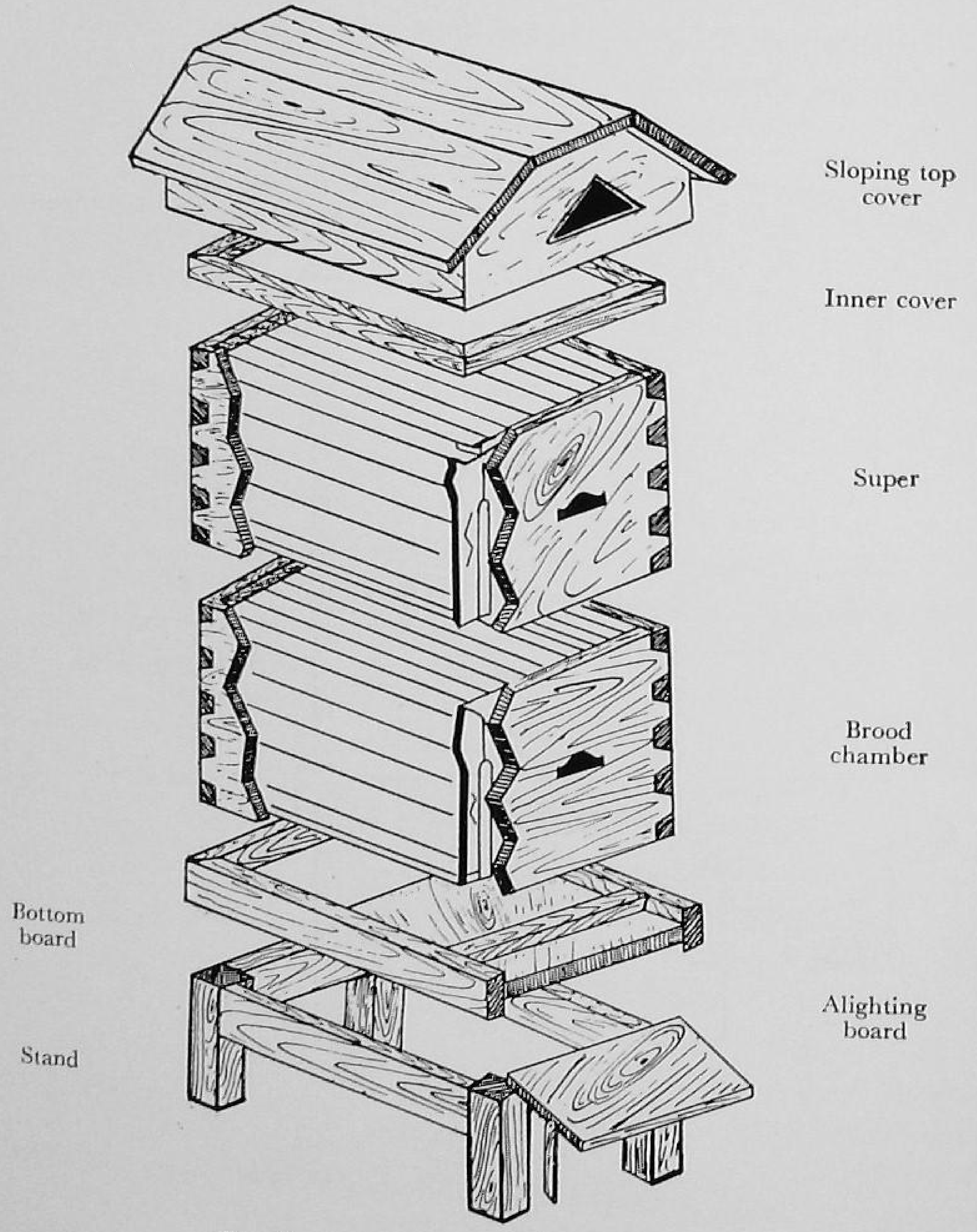
Modern Bee-hive and Other Bee Appliances

1. Government Bee-farms, Nagrota and Katrain (Kulu Valley).
2. Government Bee-farm, P.O. Jeolikota, Nainital (U.P.).
3. Messrs. Bhupin Aparias, Ramgarh (Nanital), U.P.

The indigenous methods of keeping bees in wall-hive, mud-hive and log-hive are defective and wasteful, and do not permit proper manipulation and management of a colony of bees to the best interests of the bee-keeper. The yield from such hives is very low and of poor quality. Extraneous matter, such as juice of bees, crushed bees, wings, legs and other parts of the body of the bees as well as dirt and refuse of the hives are quite common. Combs have to be cut and honey pressed out of them. As such, honey extraction consists in the cutting and consequent destruction of combs, which the bees have built up with such industrious labour. From the modern beekeeper's point of view, the making of new combs is a costly process, involving as it does, the use of 10 to 12 pounds of honey to make one pound of wax. In order to produce more and better quality honey and also to provide a suitable and comfortable home for the bees, which can easily be managed and manipulated, the use of modern hive is recommended. This hive was invented by Rev. L.L. Langstroth, the father of American beekeeping in 1851 and has been found to be the most suitable for conditions obtaining in the Punjab. The beekeepers are advised to use the modern hive instead of local hives. The two-storey Langstroth hive is illustrated on the opposite page.



**Two Storey
Langstroth Hive**



Two Storey Langstroth Hive Showing Arrangement of Parts

Management

The following points deserve consideration for good management of bees:

1. The low strength of the bee colony before the commencement of the major honey flow results in low yield of honey. In order to increase their productiveness, management of bee colonies should, therefore, aim at producing stronger colonies before the commencement of the major honey flow.
2. As the production of honey is influenced by the number of bees in a colony, for profitable beekeeping, production of colonies comprising more than 20,000 bees is recommended.
3. There is a great drain on its honey stores when a colony is endeavouring to rear large areas of brood during the brood rearing period. The stores should be carefully watched and the needy colonies helped by resorting to artificial feeding.
4. To obtain stronger colonies for the honey flows, avoidance of cessation of bee activity owing to intervals in blossoming by resorting to artificial feeding is highly useful.
5. Milk and eggs, mixed in honey and sugar, are most readily consumed by the bees and can serve as pollen substitute. Buckwheat flour is also liked best by the bees.
6. A modified queen mailing cage should preferably be used, as it permits extra ventilation and also supply of water to the queen and her attendants during transit.

Profit in Beekeeping

The profit in beekeeping depends on the yield of honey obtained, which, in turn, depends on the management and flow of honey in a particular year. An efficient beekeeper may be able to get good yield under favourable circumstances. At Katrain, on an average, a yield of 28 lbs. of honey per colony has been obtained under a good flow year, from an apiary of 40 colonies. Under ordinary conditions, a beekeeper is expected to get a yield of about 8 lbs. per colony. Any bee-minded person, in a suitable locality, can keep 10-20 colonies as a side line and can earn about Rs. 100 to Rs. 200 per annum. The initial

investment per established hive ranges from Rs. 25 to Rs. 30 in the first year. In the subsequent years, the expenses on this account are nominal, as the beekeeper is to incur expenditure only on the replacement of comb foundations in the bee-hives and artificial feeding of bees, when found necessary. This additional cash income has helped the poor farmers particularly in hilly areas like Kulu Valley.

Teaching and Other Facilities

As an incentive to the beekeeper, the Punjab Agriculture Department has organized a special sub-section under the control of the Entomologist, Punjab, Ludhiana. Two bee-farms, one at Nagrota and the other at Katrain (Kulu Valley) Kangra district are maintained by the Department, to serve as demonstration, teaching, propaganda and research centres. Two courses of training of five week's duration, one each at the two bee-farms, Nagrota and Katrain (Kulu Valley) are held in April and September, respectively, every year. Free advice on the subject is offered to beekeepers. Beekeepers are also helped in the extraction and sale of honey, as also in the running of their co-operative organizations.

XI
SOCIAL EDUCATION

CHAPTER 35

BRIGHTENING THE VILLAGES

As soon as a farmer's boy passes his matriculation examination he turns his back on the village of his birth, and would rather accept a petty clerical job than engage himself in his ancestral occupation. Why do not educated young men from rural areas settle down in villages ? People who are not familiar with living conditions in villages do not realise that life in an average Indian village is incredibly dull and hard, and education merely provides an opportunity for escape from an environment which is monotonous and unstimulating. There is so much drudgery in the life of a farmer that he is no better than a galley-slave ; and like the proverbial bullock who spends his life looking for a place to die, his toil is ended only when he lies down to die.

During the ploughing season, from early morning till sunset with a short break at noon he is patiently following his pair of bullocks. Ploughing fields with a bullock-plough is one of the dullest occupations in the world. In the harvest season he spends many hours, even during the hottest part of the day, cutting the crops with his scythe, tying bundles, and carrying them to the thrashing-floor. In the hot month of May or June he spends many days treading the grains under the feet of his bullocks. He has to lift heavy bundles of fodder on head for long distances, and this is a type of drudgery which dulls the faculties and kills all intelligence. He spends many hours cutting fodder for his cattle and in drawing water from the well. Here is the answer to the question : Why does the farmer's son think of accepting a petty job in an office rather than follow the routine which his ancestors had followed for centuries ? Even boys from well-to-do middle-class families, with holdings which can be considered as economic from any standard, would rather accept the post of an Assistant Sub-Inspector of Police or a Kanungo rather than work on their farms. Thus are the villages being denuded of their intelligentsia, and stagnation is setting in.

Mechanised farming with the aid of small tractors, and electrification of rural areas holds out a promise to the Indian cultivator of relief from the drudgery of ages. Handling of a tractor requires more intelligence as compared with use of a *desi* plough. The tractor is already becoming increasingly popular, and at the present price level of agricultural commodities even imported tractors which are comparatively costly are being readily purchased by enterprising farmers. With spares and facilities for repairs guaranteed, there is little doubt that tractors will replace the bullock-driven plough in substantial area in a progressive State like the Punjab. While the well-to-do farmers who own more than 100 acres are purchasing tractors in their individual capacity, even small-holders are combining in groups. There is an over-all shortage in bullock power considering the large areas in the riverain which are lying uncultivated, and for some time tractors as well as bullocks could continue to work side by side in breaking and reclaiming waste land. The tractors will not only relieve the farmer of toil and drudgery but will also encourage production of more milk. The fodder which will be saved from the bullocks can feed the cows and buffaloes, who apart from milk, will also supply the much-needed organic manure to fertilise the soil.

Mechanised Farming

Electrification of farms is already making headway in the Punjab as there is sufficient surplus power even from the Mandi Hydro-Electric Scheme which remains to be utilised. The Nangal and Bhakra Dams will not only provide irrigation for the thirsty lands in Hissar, Rohtak, Ferozepore and Pepsu, but will also provide plenty of cheap power to the farmer. As the late Sir Jogindra Singh said, "Alladin had only one Jinnee to help him. We have millions of Jinns in our rivers to help our cultivation." Cheap power coupled with low powered motors can perform diverse jobs on a farm. With the help of an electric motor fitted on a well the farmer can irrigate his fields. Sinking of tube-wells worked by electricity is increasingly becoming popular, and from large areas the persian wheel is likely to disappear. Lifting water for watering the cattle and for irrigation is one of the most difficult jobs in a farm. It is estimated that a pair of bullocks purchased at an average price of Rs. 1,000 gets exhausted and dies within two years. Tube-wells run by electricity will save the bullocks from so much cruelty, and will also lift much larger quan-

Rural Electrification

Joy that must come back to villages

tities of water, and thus give a great impetus to the cultivation of foodgrains. With the aid of a low-power motor the farmer can cut his fodder, press his sugar-cane, shell his corn and sharpen his tools.

Cheap power will also promote cottage industries ; and thus the rural artisans and the farmers can add to their wealth. Small saw-mills, flour mills, sugar-cane crushers, cotton gins, oil expellers, and small power-looms can be installed in a fairly large number of villages. The benefits of cold-storage can also be extended. It will particularly encourage potato cultivation and save fruits and vagetables from wastage. Rural electrification will also help in providing good life to the farmers. To improve life in the rural area we must bring the modern scientific advancement within the reach of the farmer. As Mr. Gillete observes : "Though progress does not consist wholly in material advance, it does seem to be true that improvements in minds and morals are not found without it." Civilization with advanced methods of production is, in fact, found amongst the cultured, the politically progressive, and emancipated peoples. Such a progress can be brought home to the Punjabi cultivator if education in agricultural science is provided to the youngmen, mechanised farming is encouraged, and rural electrification is made a reality. The dullness of the village life is banished by providing reading rooms and libraries, and by encouraging games. Thus the dream of the author of England's Green and Pleasant Land can be realised in the countryside of the Punjab if we keep the ideal before us that "the work of making an agricultural class able, must be barren if it is not joined to the work of making that class understand that farming is merely a means to an end, and that end a good life, for farmers and everybody else."

Electrification will bring civilization to the rural areas and will brighten the drab and sordid existence of the Indian cultivator. Electricity can also be used for domestic lighting in villages particularly along the roadsides. On account of shortage in kerosene oil most of the villagers have nothing to do after sunset, and after taking their meals they go to bed. If they can get electricity for domestic lighting they can spend their leisure in reading, and their womenfolk in knitting and sewing clothes for the family members. Life in dark houses dulls a person's faculties. Electrification of

houses in the rural area will have a beneficial effect on the intelligence of the population also. Three T's, Tubewell, Tractor and Trailer, have already become the symbols of a progressive farmer in East Punjab. Rural electrification and mechanisation of agriculture will liberate the children of the farmer from galley-salve drudgery, and will make farming a pleasant and more profitable occupation. It will also create leisure which the farmer and his family can utilise for educational and cultural pursuits.

Need of a New Education Policy

The Punjab is a predominantly agricultural State. The uncertainties of life in a border State are also not conducive to the development of big industries. That is why a large number of capitalists who alone could invest capital in large scale industry have migrated to the safer districts of the U.P. and other States. Apart from development of small scale cottage industries with increase in available electric energy, with few exceptions there is little likelihood of development of large-scale industry in this State. In a predominantly agricultural State, agriculture naturally must remain the main industry of the people. As such, there is need of re-organising education on a new basis taking the requirements of the population into consideration. Education in arts subjects can be good enough for people with surplus money who can afford to spend money on education of this type, or for people who desire employment in clerical professions. As a result of the policy of graded cuts in the quasi-permanent allotment of land scheme, large holdings have been levelled, and increasing assertiveness among tenants has dimmed the prospects of the sons of well-to-do land-holders in other villages. Hence, so far as the villages are concerned the class with surplus money is virtually disappearing. So far as clerical jobs are concerned the saturation point has been reached, and the supply has exceeded the demand many times. Hence, the need of reorientating the education policy to meet the actual requirements of the people of this State is indicated.

There is also need of severely checking education in Law, for there are far too many unemployed or semiemployed lawyers. It was as early as 1879 that Monier Williams thus pleaded for restriction in the number of lawyers: "A limit should be put by law to the increase of native pleaders. If Indian money-lenders are metaphorically called incarnate curses, Indian 'Vakils' are rapidly earning a

title to the same flattering appellation. I have heard the natives complain of what they call the oppression of our Law Courts with their elaborate machinery of expensive processes and appeals. What they mean is not that injustice is done, but that justice is overdone. They might, with more reason, complain of the oppression of their own Vakils who live by promoting quarrels, prey upon litigants, and drain the very life-blood out of their own fellow-countrymen."

The controversy raised over the location of the proposed Agriculture College for East Punjab with claims for Ludhiana, Karnal, Hissar and Ferozepore put up by interested persons itself shows the urgent need of expansion of education in Agriculture. Instead of providing one Agriculture College it would be worth-while to close some of the Arts Colleges and to provide Agriculture Colleges in at least five districts of the State. With prevailing food deficits in the country the paramount importance of Agriculture in the economy of the State has been brought home not only to the cultivators but also to the educated townsmen who do not get enough to eat. Interest in progressive agriculture has been greatly stimulated by the high prices. Agriculture as a profession was till lately regarded as good enough for clod-hoppers and illiterate *Jats* and *Chamars*. As a career for educated young-men it was entirely out of question, and even sons of landowners who have fairly substantial holdings hold the same opinion. In fact education is regarded by them as an opening for escape from their ancestral occupation. What Professor Carver says about Ireland holds true about the Punjab as well. "Now it is true that there are probably few fortunes made in agriculture ; it is not a business that lends itself readily to the amassing of large profits through speculative undertakings. It provides a better living for a greater number of persons than any other occupation but, as at present managed, it possesses little attraction for men of high spirit and enterprise ; there is a tendency in almost every country for the less vigorous, the less capable and the less enterprising youths to be left on the farms. There is a sort of idea that any fool can be a farmer, that all that is required for those who cannot find employment in industry is a few acres of land ; most people seem to hold the belief that they could make a success of farming if they had the opportunity, and few realise that to be a thoroughly equipped scientific farmer probably requires a higher education, certainly a more complete scientific education, than any of the learned professions, with

the possible exception of medicine. Under these circumstances it is small wonder that agriculture has been neglected ; the farmer has been the forgotten man and until comparatively recent times, he has attracted little or no interest from Government or the rest of the people."

With the attraction of high prices and rise in unemployment among educated young men from the rural area the attention of educated people is being increasingly diverted to progressive agriculture. Education in arts subjects hardly equips a person for the profession of farming. Like the medical science, the science of Agriculture is a complicate one, and to be a good Agriculturist a person must have mastery over a number of sciences, like Botany, Chemistry, Plant Physiology, Soil Science, and Agronomy. It requires keen observation as well as capacity for hard work. Education in arts subjects softens a person and develops aversion to manual work. The net result of such education is the Babu who cannot even look after himself and must have a servant. The tradition of Babuism can only be killed if education is given a practical bias. As Mr. Calvert says, "In India the tendency seems to be to take an exaggerated view of bodily pain and of the inevitable inconveniences of a rough and tumble life. Compulsion is resented ; discipline which lies at the root of all organisation is apt to be under-valued." Hardihood and sense of discipline can only be developed if education has a practical bias. This indicates the need of a short course of a year or so after the matriculation stage in which the sons of well-to-do farmers are given instruction in the handling of tractors, pumping sets, and low-powered electric motors. The longer course should be for students who would like to be employed in the State Department of Agriculture. Even for employment in the revenue department, preference should be given to graduates in Agriculture as they are better equipped to understand the problems of the rural population and to help them in their day-to-day needs.

Rural Artisans

So far as rural artisans are concerned they should be encouraged to improve their efficiency by short term courses in vocational training centres. With the electrification of the rural area there would be need of imparting vocational training to the sons of rural artisans on a larger scale. Sons of cobblers, weavers, carpenters, ironsmiths, tailors,

A Project library

Reading rooms spring up in villages

oil-crushers and potters should be given an opportunity to improve their technique and deserve to be provided with loans in kind in the form of small machines which they can install in their homes. This will also check the growth of slums in the towns and bring about a happy balance between the town and the country. Further, this will save the artisans from drifting into inefficient agriculture.

Libraries and Reading Rooms

What other means should be adopted to check exodus from the rural area to the towns? This exodus can be partially checked if the village is made more attractive. An educated villager who has seen the world whether in the army or otherwise and who ultimately returns to his village and lives there for fairly long spell of time inevitably feels the dullness of the village life. The dullness and monotony of village life in due course kills all ambition, and stifles intelligence and initiative in a young man. Ultimately, the results of education and experience are lost, and he is brought down to the level of the common villager whose main pre-occupation lies in running down his enemies, and in promoting village factions. The party factions in the villages scare away intelligent people including retired government servants from their ancestral villages, as they very rightly apprehend that if they settle down in their villages they will inevitably find themselves drifting to the courts. What measures should be adopted to brighten the villages and to mitigate their dullness? The dullness of village life can be appreciably lessened if reading rooms and libraries equipped with modern furniture, radios, pictures, and books are established in villages. In these reading rooms the educated villagers can spend their leisure hours in an interesting and useful manner in a pleasing and restful environment. Some people will ask "Why should the reading rooms in villages be decorated with pictures and made beautiful?" A reading room decorated in an orderly manner would have a far-reaching effect on the mentality of the farmer. He will acquire a sense of beauty and orderliness. It will help him even in his profession. In fact, a good farmer possesses sense of beauty and orderliness ; that is why he levels his uneven fields, raises straight embankments, and sows his crops in lines. That is why a good housewife arranges domestic utensils in her home in neat and orderly rows. These reading rooms will also save the educated villager from relapse into illiteracy. Education should

not cease with the school. Education lies in acquiring the benefit of experience of others. A person acquires experience and education by meeting people who are wiser than he, by travelling, or by reading books which contain the quintessence of the experience of others. Books are the best medium for benefiting from the experience of people who are far away, even in remote countries. Thus in educating the villager in real sense these reading rooms have an important role. A start in this direction has already been made in many villages of the districts of Ambala Division.

Games have just as much importance in relieving the dullness and boredom of village life as reading rooms. Wrestling bouts were common and popular about 20 years ago in the villages of the Punjab. "*Dangals*" were held on the occasion of the fairs, and the wrestlers were given liberal donations by the villagers who used to assemble to watch their skill. The school boys used to play foot-ball, *Kabaddi* or volley-ball in the village common. All this is disappearing with disastrous result on the village life. The instinct to distinguish oneself from the common crowd is universal, and is as much found among young men in the villages as in the towns. With no opportunities for games this instinct finds an outlet in crime, and the dacoit has become the popular hero. Even from the point of view of prevention of crime, sports should be encouraged in villages. Now that Consolidation of Holdings is going on in the districts of the Punjab on such a large scale it is necessary that a suitable piece of land is demarcated for a play-ground in every village. In villages where the *Panchayats* are doing useful work, bar-bells, parallel bars and ropes for tug-of-war should also be provided. Matches among village teams should be encouraged. The maxim, "prevention is better than cure," holds as good for public morals as for public health. Thus the surplus energy of the village youngmen will find a healthy outlet in sports rather than in crime, and the State Government will possibly have to incur less expenditure on police administration.

Games

The folk songs of the Punjab country-side, with their burden of love and labour, have a peculiar charm of their own. In these songs, which are simple like the Punjab peasant, we feel the heart-beats of the rural people. We share their joys and sorrows. We hear the tinkling of bells of the

Folk Songs

cattle returning home at sun-set, and we enjoy the beauty of the earth. They take us to the waving fields of green wheat speckled with yellow *Sarson.*

These songs make a direct appeal to us, for they remind us of many simple events and situations in our own lives. *Shahidis,* the ballads of warfare, echo the clang of weapons, and the neighing and trampling of excited steeds. The gushing of blood from the wounds of the hero, the rolling of severed heads of the enemies into dust is vividly described. The hero goes to the battle with serenity and imperturbability, as if going to a bridal feast. In these songs we hear the laughter of a race, and the wail of generations of young women separated from their lovers. The groves are ringing with the peals of laughter of young girls swinging in *jhulas* from the branches of *neem* and *peepal* trees.

In the star-light one hears the thud of the *dholak* drum drowned by the voices of young women singing the songs of marriage. The braids of the bride are being woven, and draped in red cloth she is preparing for the ordeal of marriage. The marriage being over, she is carried by *kahars* in a palanquin, and leading the bridal procession is the bridegroom on horse back. In her father-in-law's home a new experience awaits her. She would be lucky indeed if she gets a kind-hearted mother-in-law. An out-sider has come to share her son's affections, and a strange type of jealousy develops between the young wife and her mother-in-law. The mother-in-law has gone through a generation of drudgery and toil. She starts her day in star-light when the cock crows, and spends two hours grinding flour with the hand mill. Then she milches the buffaloes, churns the curd, and makes *lassi* and butter. When free from this work she prepares the morning meals, and takes them to her sons and husband who are ploughing the fields. The laziness of the young bride is tolerated for sometime, and then she is asked to share the toil by her mother-in-law. In the folk songs one hears many complaints from the young wife regarding the various types of work which she is compelled to perform. The monotony of domestic life is only relieved by visits to the well, or the occasional tiffs with the *dewar,* the husband's unmarried younger brother.

Punjab is the land on the Northern Frontier of India, which has always borne the brunt of foreign invasions. Hence life in Punjab

has been particularly insecure, and women have been intensely attached to their brothers and husbands. Even now, large numbers of young men in Punjab join the army leaving their brides behind. The pangs of separation of the newly married brides are described in a number of songs. Equally great is their pleasure on reunion with their husbands when they return home on leave. In the songs of re-union one hears the laughter of generations of young men and women.

Life in rural areas was not so colourless and drab about a decade ago. The quiet and stillness of the night was broken by the melodies of young girls whose songs accompanied the humming of the spinning-wheel. The somnolent sound of the spinning wheel which sounds "*ghoon ghoon*" casts a spell on the girls. It is linked with sentiments which agitate their hearts. Thus writes the folk singer in his song of the spinning-wheel:

"*Ghoon, ghoon,* O spinning-wheel,
ghoon ghoon,
Should I spin the red roll of carded cotton
or not?
Spin, girl, spin, O spin, girl spin.
Far off is my father-in-law's home,
O spinning-wheel.
Should I live there or not?
Live, girl, live, O live, girl, live.
Long, long is my tale of woe,
O spinning-wheel.
Should I tell or not?
Tell, girl, tell, O tell, girl, tell.

The songs of the sisters of the spinning wheel are vanishing from the countryside. Gaily decorated *charkhas* studded with mirrors and *cowrie*-shells are becoming scarce. The *trinjan* is no more to be seen, and remains only a pleasant memory of the by-gone days of rural simplicity. With the wave of puritanism which has swept over the countryside in the form of religious reformistic movements, song and music have virtually disappeared from our villages. The peripatetic preacher with his harmonium is a poor substitute for the

Piping songs of innocence

A hill folk-singer

village bard and the minstrel. The folk songs which survive in some villages which have been saved from the onslaught of puritanical reforms are also in danger of extinction. The soul of the rural people is being bartered away for the doubtful gains of the so-called religious reform. Dull and monotonous *bhajans* and *shabads* are replacing the soul-stirring folk-songs which have their roots in the remote past. The exodus of Muslim *mirasis* to Pakistan who regaled the people with their jokes has further added to the dullness of village life. The gramophone fitted with loud speakers has already invaded the countryside, and the cheap and vulgar film music is ousting folk songs.

It is village women who have been the custodians of the ancient folk songs, and have preserved the tradition of dance and music. They are developing an inferiority complex now, and regard their songs, dances and even dress as something primitive and unworthy of ladies. This is having particularly unfortunate results in Hariana districts, where the women-folk are being told that their colourful *ghagri* is unworthy of educated women-folk, and are being asked to adopt *salwars* as their dress. Folk songs are regarded only good enough for yokels. Now that people are discovering the values of ancient culture, perhaps the folk songs can be rescued from the onslaught of the film and the gramophone. It is time that we cry halt on the so-called reform, and rescue our ancient folk songs and dances from the crusade of religious maniacs. This duty has devolved upon the State. Some ardent collectors of folk songs like Devendra Satyarthi and Ram Saran Dass have done yeomen's service to the rural people by recording the folk songs of the Punjab country-side, and have thus saved many lilting melodies from sinking into oblivion.

Folk Dances

People who have not seen the Punjab Himalayas often get an impression that folk dances are foreign to the Punjab. The Gaddi shepherds of Kangra Valley have preserved their ancient dance and music in spite of the opening of the valley to tourist traffic. Dressed in kilts of snow-white wool with their loins girt with yards of thick black ropes, they dance with a spirit of abandon and freedom to the tune of the thumping sounds of the Nagara drums. Their women-folk dressed in colourful home-spun garments and overladen with silver jewellery sit round the men-folk in a circle, and provide

them inspiration. These Gaddi women are comely and graceful, and have dignity and poise, and look like queens of the valley. *Lugri*, a liquor made from fermented rice, keeps their spirits up and to the accompaniment of the sound of the drum they dance till late hours in the night recounting the nocturnal adventures of the Gaddi lovers, Konjua and Chanchlo, the Romeo and Juliet of the Chamba Valley.

However, it is the men from Seraj, Kulu, who have originated folk dances which are marked by high quality. Dressed in white long-coats, with black caps on their heads topped with tufts of iridescent *Monal* plumes they appear very picturesque. To the sound of drums and trumpets they dance the whole day through. Their sword dance is very manly, and they execute it with spirit of joy particularly when they are surrounded by a large crowd of their womenfolk wearing colourful aprons, red, green, and scarlet, and multicoloured blankets draped around their bodies. Under the inspiration of the dance and music they forget their worries and the rigours of their hard mountain life. Their songs of hope and sorrow are rich and varied, and have a primitive dignity of their own.

In the plains it is the Labana Sikhs, Rai Sikhs and some Jat Sikhs from Sialkot, Sheikhupura, and Gujranwala, who have preserved the tradition of *Bhangra* dance. *Bhangra* is a dance of vigorous people which is marked with exuberance of spirits and display of elemental energy. The onlooker is impressed by the strength and vigour of the dancers who punctuate their rhythmic movements with folk songs which are often ribald.

Bhangra is a dance of the Punjab plains which is truly symbolic of the sons of the soil, who have to bear the rigours of the Punjab climate which is like an inferno in summer and is cold and frosty in winter.

Baghs and Phulkaris

It is also desirable to revive the designs of *Baghs* and *Phulkaries* in embroidery. *Baghs* and *Phulkaries* were embroidered by the village women of Punjab about a decade ago. Pieces of home-spun cloth dyed in rich crimson colour served as a back-ground for beautiful designs embroidered in yellow silk floss. Closely embroidered designs which entirely covered the cloth were called *Baghs*, *i.e.*, gardens, while

those with spaced designs were called *Phulkaries,* which means "scattered flowers". The country women spent their entire leisure embroidering the *Baghs,* and a good *Bagh* took one to two years to be embroidered. Young girls embroidered *Baghs* and *Phulkaries* for their dowries which they took with them on marriage to their father-in-law's house.

The *Baghs* and *Phulkari* designs from Moga tehsil in district Ferozepur are well-known for their beauty and elegance. The *Phulkari* designs from Doaba districts are comparatively crude. Influx of cheap and gaudy machine-made printed textiles from foreign countries has dealt a death-blow to the ancient embroideries. The scorching drought of modern vulgarity is parching the throat of art and life. Moreover, the village women do not have the same leisure or patience as their ancestors had, and have also lost the skill which the old women possessed. The exotic D.M.C. styles have also done a good deal of harm. It would be desirable to collect specimens of *Baghs* and *Phulkaries* from all the districts of the Punjab and to preserve and exhibit them in a suitable museum. The *Phulkari* designs also deserve to be introduced in embroidery classes of girls schools. They can be adopted for embroidering house-hold linen, curtains, *sarees,* blouses and children's garments. The Bayeaux tapestry of France finds honourable mention in the history of Europe. In the cultural revival of the rural Punjab it is desirable that the beautiful designs of *Phulkaries* and *Baghs* are resuscitated, so that this art, which is on the verge of extinction, gets its due place in modern life.

In the cultural revival of the Punjab, folk dances, songs and drama have their place. It is not only by providing material prosperity that a people can progress. It is only when their spirit is revived and they feel the joy of life which they freely express in song, dance and music that people live again. The true beauty of a country-side lies in the happy faces of its people, rather than in its streets and buildings. It is the cultural revival which lays as much emphasis on the spirit of man as material prosperity which is our aim. It is only when the country-side of the Punjab will reverberate with the songs of the people, a happy and freed people, bringing joy and happiness to all that the true rebirth of the countryside will take place.

CHAPTER 36

COMMUNITY CENTRE

(Panchayat-ghar)

An ambitious programme of " Extension " has been launched under the Community Project Scheme. A group of 100 villages with a population of about 66,000 has been selected as a new unit of administration called the Block. In intensive development blocks known as Community Development Blocks groups of 5 villages each have been entrusted to the care of Village Level Workers, who are the multi-purpose extension workers. In less intensive development blocks, which are known as National Extension Service Development Blocks, a unit of 10 villages has been entrusted to a Village Level Worker. It is proposed to provide suitable buildings, and residential and office accommodation, as well as stores and godowns for the storage of fertilizers, improved seeds, and implements at the Block Headquarters.

The Police Station was the pivot of governmental activity in pre-independence days. Now under the Welfare State the Headquarters of the Development Block will be the seat of beneficent activities of Government, and will assume greater importance. While every village should have a Community Centre, there is need of a Multi-purpose Building at the Headquarters of the Village Level Worker to serve as the nucleus of all developmental activities for a group of 5 to 10 villages. Thus the Panchayat-ghar or the Community Centre has acquired a special significance under the new administrative arrangement for fostering extension work in the villages.

Panchayat and Village Development Council (Vikas Mandal)

Why all work done under official guidance in pre-independence days failed to take root is explained by the fact that the initiative came from above rather than from the people. Unless initiative is taken by the villagers themselves through the Panchayats, all improvements in due course wither. Panchayats have a special role in the field of rural development. Where a Panchayat is functioning successfully, it can take up the development work.

However, where there are party factions, and the Panchayat is not representative enough, Village Development Councils provide the remedy. The willing members of the Panchayats form the core of the Village Development Council. In addition, the village officials, such as the Patwari, the Lambardar, school teachers, and progressive farmers including retired Government officials should be associated. Thus these bodies will be fully representative, and can serve as agencies through which the local development programme can be formulated, and implemented. At the Regional Conference of Development Commissioners of Northern Region held at Batala in November, 1953, it was recommended that the Village Level Workers may be appointed as Secretaries of the Village Development Councils. A step in this direction will certainly enhance the influence and effectiveness of the Village Level Workers.

Panchayatghar

The Panchayatghar is the common building built by the people themselves with their own co-operative effort, where the Panchayat or the Village Development Council meets and draws its programme for development, and reviews the progress of work. As Dr. Katju has put it, " A Panchayatghar is the very pivot of the whole rural development plan. A Panchayatghar does not merely mean a building where villagers can come together and meet and discuss village topics. It is much more than this. It should be a living monument and symbol of village unity and organization, and the centre of all village activities. It should inspire every resident of the village—man, woman and child—as an embodiment of their corporate life."

Each Panchayatghar should have sufficient accommodation to house a library, a dispensary, a veterinary first-aid centre, a social education centre, and a cooperative seed and implements Store. The main room of the Panchayatghar should be decorated with posters and pictures of agricultural interest. Products of local cottage industries as well as seeds of improved varieties of crops, which are being encouraged, should also be displayed so that it serves as a small Development Museum. The main hurdle in the field of " Extension " is the distance between the cultivator and the places where improved implements, fertilizers, etc., can be had. If the implements and fertilizers are near at hand, every farmer can

make use of them. Thus one of the most important functions of the Panchayatghar is that it should serve as a store from where improved seed, implements and fertilizers can be purchased by the farmers.

Libraries

One of the rooms should be developed as a library, and should be decorated with pictures, educative posters and charts. Village reading rooms and libraries equipped with good furniture and paintings considerably relieve the dullness and monotony of the village life. Here the educated villagers can spend their leisure hours in an interesting and useful manner in pleasing and restful environments. A beautifully decorated room will also awaken the sense of beauty in the villagers. It is not only in towns and among the educated class of people that we find sense of beauty. The village house-wife, who arranges her utensils in a neat and orderly manner, too possesses it in abundance ; otherwise she would not take pains to arrange *Thalis*, pots and pans in neat-rows. A good farmer levels his uneven fields, raises straight embankments, and sows his crops in lines. Thus, aesthetics has a role in rural development also. A large number of reading rooms equipped with well-designed and sturdy furniture and decorated with prints of well-known Indian paintings and suitably selected books have been set up in a large number of Community Centres in the villages of Punjab. In Sonepat Community Project the villagers have converted their *choupals* into Community Centres on an extensive scale, with obviously beneficial results.

Night Schools

The Community Centres also serve as night schools, where the adults gather in the evening to learn the alphabet, as well as to pick crumbs of knowledge. Radios are also provided for entertainment as well as instruction.

These buildings also provide a link between the farmer and the research worker. Extension staff of the Agriculture, Animal Husbandry, and Health Departments collect villagers at the Community Centres to impart instruction, and to give advice to the villagers. The Health Officers use the Panchayatghars for inoculation and vaccination of the villagers during the epidemics of cholera and small-pox. For their common ailments the villagers approach the Village Level Workers, who are provided with First-aid Boxes.

A poultry shed close to the Panchayatghar for housing improved breeds of poultry, such as Rhode Island Red, and White Leg Horn, is also a necessity. From the poultry shed the birds can be given to the villagers.

Poultry

If irrigation is available by means of wells, a nursery of fruit, ornamental, and timber trees should also be started near the Panchayatghar.

Nurseries

Where sufficient space is available around the Panchayatghar, village games, like *Kabaddi*, tug of war, foot-ball, and volley-ball are played. Wrestling matches are held and instruction in physical culture is also provided.

Games

Community Centres have a special role in the rural extension programme ; they are nuclei of all developmental work, which provide developmental facilities to the villagers at their very doors, and also serve as light-houses radiating culture, knowledge and happiness.

CHAPTER 37

COMMUNITY FESTIVALS

Melas are synonymous with joy and gaiety; and in the countryside where life follows a hard routine, nothing is more welcome to the people than the prospect of a festival or Mela. A rural Mela in India has a special significance. It is not just an occasion for festivity and mass gathering in the ordinary sense. It is an unbounded expression of the spirit of inner freedom, of creative pride, of zest for life, and of colourful traditions permeating the farmer's life. Now when it is being recognised that the correct approach to rural reconstruction lies through reorganisation of community living, the role of planned Melas acquires particular importance.

The Punjab had its first round of Kisan Melas in 1953 in the month of November, the time when the cultivators are relaxing after the Rabi sowings, and when their hearts are full of new hopes. Each Project Area planned its own Mela having as its core the elemental culture-expression of its people, and rounded off with a colourful exhibition that combined instruction with recreation.

Planning of Melas

Careful planning preceded the celebrations. There were many aspects to be considered, many problems to be solved. These Melas were the first of their kind, never held before. The idea had first to be properly publicised, and local enthusiasm created and nursed. This was not a simple matter. The apathy of tradition-governed people to what they regard as an innovation had to be conquered, and their active cooperation secured; the difficulty of transport, which accounts for the inertia and immobility found in villages, and which makes speedy publicity well-nigh impossible, had to be reckoned with; the Mela had to be given a personality, at once attractive to the villager and impregnated with the developmental motif; various Development Departments had to be invited to participate in the exhibition, and accommodation had to be arranged for their stalls and staff; important industrial and commercial

interests had to be persuaded to take part ; and finally money had to be found locally for all these elaborate arrangements. But all these difficulties were overcome and the Melas had an unusual measure of success. The average participation in each was in the neighbourhood of one lakh persons.

In each Project area a Mela Committee was formed, weeks before the scheduled date, consisting of District Officers, Project Executive Officer, and enthusiastic local persons. The Committee went into details such as selection of site, arrangement of stalls and other accommodation, provision of entertainments, drawing out a full Mela programme, and launching vigorous publicity. In many cases small committees were appointed to deal with various important items. Liaison was established with the District Heads of Development Departments and representatives of engineering industries to secure their fullest cooperation.

The Round Starts

The Melas were held from the 30th October to the 1st November at Sonepat, from the 6th to the 9th November at Nawanshahr, on the 14th and the 15th November at Faridabad, from the 17th to the 20th November at Jagadhri, on the 21st and the 22nd November at Nilokheri, and from the 28th to the 30th November at Batala. The Ministers visited the Melas, performing the inauguration in most cases ; and this contributed in no small measure to the popularity which they gained. The Nawanshahr Project had no less a distinguished visitor at its Mela than the Prime Minister, Shri Nehru, himself. The festival at Batala was visited by delegates from different States participating in the Regional Conference of Development Commissioners, as well as by several representatives of the T.C.A. and the Ford Foundation.

Apart from differences of detail and some characteristic features of each Mela, which are briefly described below, a broad similarity was in evidence everywhere. These were mass gatherings of *Kisans*, who are the same throughout the Punjab—sturdy, carefree children of the soil, knitted automatically into a strong brotherhood through common experiences and historical mutations. Everywhere there was the same spontaneity and unreservedness in their merriment, the same pride in native culture, the same curiosity about new ideas,

the same openness of mind and eagerness to understand and to be instructed. Above all, there was a common upsurge of optimism and confidence in the future, which are characteristically Punjabi traits.

Sonepat Mela

This was the first of the Mela round. Villagers came in thousands from all directions, carrying placards and banners, and shouting slogans of rural uplift.

There was a varied programme of entertainment. Various aspects of village life were taken up separately, and each was dealt with comprehensively. Local produce competitions were organized, and prizes awarded to the best producers. A big cattle show was held, and prizes were given to the best breeders. Some of the animals exhibited, particularly the Hariana bulls, were magnificent specimen. Sport competitions were also organised, the wrestling match in which the best Indian wrestler, Kesar Singh, participated, providing the greatest fun. An inter-village competition in community work was also instituted, and seven villages, namely Fazalpur, Rathana, Kalupur, Teha, Sandal Khurd, Jakhauli, and Jajal were awarded Rs. 150 each for their achievements in different fields. Individuals and parties that had done the best social work were also given prizes.

A separate programme for children was gone through. Six baby shows were organised in Teha, Khubru, Seoli, Jataula, Kamashpur, and Juan villages, and sixty children awarded prizes.

The exhibition at the Mela was an interesting item. Besides the Community Project stall, which contained a wide assortment of charts, maps, posters, and medals, there were stalls put up by the Agriculture, Veterinary, Health, Industries, and other Development Departments. Various firms dealing in agricultural machinery also participated, and gave demonstrations of modern implements.

There were several other functions also, like the *mushaira*, dramas, humorous skits, dance recitals, and folk songs. Cinema shows of interesting documentary and departmental films were also arranged, which attracted thousands of villagers at night.

A film of the Mela was taken by the Films Division of the Ministry of Information and Broadcasting. The festivities lasted for three days, and constituted the most colourful rural event of the year in the Sonepat Tehsil.

Naura, a village 3½ miles away from Banga on the Banga-Garhshanker kacha road in Nawanshahr Tehsil, had the privilege of welcoming the Prime Minister to its Kisan Mela. It was a historic occasion for the simple inhabitants of this small village in the interior of the countryside. Caught in the small concerns of their daily life, little could they imagine that the Community Mela would bring their beloved leader right into their village—aye into their very houses. And when the news spread that Nehru was reaching Naura, tens of thousands of villagers from all over the Tehsil, and from even beyond, poured into it, coming by buses, bullock carts, or on foot. Naura suddenly leapt into world news ; and the Community work of the Nawanshahr Area came under spot-light. Gujjarpur, a model refugee village, which was visited by Shri Nehru and admired by him for its really model character, was splashed in photographs in all newspapers. Shri Nehru paid a visit to the exhibition organised in the Mela, and was much impressed by its educative value. He awarded a Shield to village Naura for the best all round development. Before his departure he addressed a huge gathering of over one lakh villagers, praising their self-help and exhorting them to continue their efforts.

Nawanshahr Mela

The Nawanshahr Project Mela was a great success. It had, of course, a special windfall in the Prime Minister's visit. But even otherwise, it was a nicely planned festival. With its cattle show, village sports, scouts rally, dramas, folk dances, and exhibition, it has left memories in the villagers' minds which will linger for long.

Faridabad Mela

This was an out-and-out rural show. The cattle fair, the ploughing competitions, the *Kabaddi* and wrestling matches, the exhibition of rural arts and crafts, the characteristically colourful folk-dances, the highly emotional folk songs, the rural dramas—all combined to make it a real Kisan Mela. Here, as elsewhere, Government Development Departments took part with enthusiasm in the rural exhibition which attracted big crowds. A Baby Show was also organised. The fair lasted for two days ; and streams of villagers from all over the 5 lakh acres of Balabhgarh and Palwal Tehsils poured in to participate in it.

The Community Mela at Jagadhri was combined with the Mela held annually at Kapal Mochan, which is situated at a distance of two miles from Bilaspur. This provided additional attraction to the visitors attending the Kapal Mochan Mela. It was for this reason that unusually large numbers visited the fair.

Jagadhri Mela

The exhibition put up at the Mela was a very attractive little show. Apart from the departmental stalls of Government, which were tastefully arranged, there were stalls of commercial concerns dealing in agricultural machinery. The Saraswati Sugar Mills exhibited a beautiful model of a Model Village, and demonstrations were given in the use of tractors, plant sprayers, pumping sets etc.

Competitions were organised in cattle breeding, crop production, and ploughing, and prizes awarded to the winners. A baby show was also held. In addition, rural sports were also held in which village teams participated.

Nilokheri Mela

A two-day Community Mela was held at Nilokheri. People from the surrounding villages in the Project area thronged the fair in their thousands.

At the exhibition put up at the Mela, improved agricultural implements, improved seeds, and various fertilizers were displayed and methods of increasing yield were explained. The stall put up by the Mahila Ashram, the seven stalls of the Industries Department in which handicrafts of small and cottage industries of Karnal district were displayed, and the exhibits of the Health and Education Departments provided great interest for the villagers. The miniature model village, prepared by the staff and trainees of the Social Education Training Centre was highly instructive. A cattle show was organised by the Animal Husbandry Department, where about 100 selected cattle were exhibited. The dangal, village sports, baby show, variety show, folk dances and dramatic performances were other highlights of the Mela.

Batala Mela

The Regional conference of Development Commissioners which commenced at Batala a few days before the date of the Mela added in large measure to the extensive popularity gained by the fair. Delegates came from a number of States adjoining the Punjab, and their interest in the Commu-

nity work in the Batala Project, which is one of the most highly spoken of developed areas under the Scheme, provided extra fillip to the enthusiasm of the organisers of the Mela. It was a really eventful affair. Side by side with the exhibition, which was one of the best of its kind held in the Punjab, an extensive programme of rural arts and folk festivities was arranged. Drama parties were called from all other Project areas, and people had an opportunity of seeing a kaleidoscopic picture of the rich and variegated culture pattern of various districts in the State. The Extension Training Centre at Batala is by itself a model village with neatly arranged hutments, cheap and simple sanitary arrangements, beautifully laid out orchards, and model cattle sheds. The visitors had a delightful time seeing the Centre.

Retrospect & Prospect

This in brief is an account of the community fairs which the Punjab celebrated in 1953. As one reflects on the enthusiasm created by these in the countryside, one is drawn to the conclusion that there is genuine need of making such fairs an annual feature of the Development Programme Those who have visited the Melas knew what great educative value these possess. What could not have been achieved over by long sermons to the villagers has been done through these simple colourful festivities. And as one looks out into the future, one sees an ever increasing role played by cultural activities in the shape of mass celebrations, in creating the will to progress in the countryside.

CHAPTER 38

CHILDREN'S ORGANISATIONS

(Bal Sabhas)

In all advanced countries child welfare finds an important place in national planning. Both the parents and government take joint responsibility for their children. Public child nurseries are set up all over the land. These nurseries become the feeder channels of the nation. Unfortunately, however, in our country the child welfare movement has not taken any dynamic shape. Our children are not really "brought up"; they merely grow up some-how. Economic disability is, no doubt, responsible to some extent for this neglect but the main factor in the situation is the carelessness of parents and lack of sufficient public interest in child welfare work. Bal Kunj Baris have been organised here and there, but these are confined exclusively to a few big cities. It is very necessary that every city, every town, and every village should have these children's parks. In the Community Development Areas in particular a determined effort should be made to create public enthusiasm for the child welfare programme, which is an integral part of the social education work.

Objectives of Child Welfare Programme

The child welfare programme, like any other work of importance, requires sufficient fore-thought and planning. The broad objectives should be clearly grasped. It must be understood that no programme for child welfare can acquire meaning unless it is consciously designed to bring out the best in the child's personality and to help him to overcome his disabilities. Inculcation of civic sense, improvement of habits, development of courage and confidence, building of good physique and mental health, creating belief in dignity of labour, and fostering community living habits are the major objectives which the programme should aim at.

Preparing the Programme

The programme for every village would have to be prepared with reference to local conditions, like prevailing customs, level of education of the people, general standard of living, availability of local talent for organising the Bal Sabahs etc. Programmes cannot and should not be prepared without

Children's parks spring up in community areas

Children playing Kabaddi

ee-saws are very popular in Children's Parks

o boredom for them now

making a thorough field study. Even then the job would not be complete unless all details are worked out in consultation with the people for whose children the programme is to be designed. The Extension Worker would, of course, have to provide the necessary initiative as well as guidance in this regard. While no hard and fast rules can be laid down, he should bear the following points in mind in order to achieve good results :

(*i*) Fullest co-operation of the people must be aimed at. They should be made to feel that the programme is of their own devising ; and they should be made to participate in it at every stage so that ultimately they take up the work actively, and the role of the Organizer is confined to providing only guidance. Leadership would develop from within the community, and the habit of co-operative working and of solving village problems themselves would be fostered among the people. The Organizer may have to go slow, but there is no short-cut to success. People are not likely to take to new things readily, and the greatest tact would be needed to win their co-operation and to create necessary interest for the work ;

(*ii*) The programme should be related to the resources of the community, as well as to the capacity for absorbing new ideas. No attempt should be made o change the community 'over-night' or to alter the traditional out-look with a jerk ;

(*iii*) The programme should not involve any considerable money expenditure. People would be prepared to spend money only when they have grasped the utility of the programme through its actual working ;

(*iv*) Only such programmes have chance of success as do not demand too much effort, and can from the beginning provide sufficient interest to the participants. Much intellectual imagination is not needed for devising the programme.

The first problem that has to be faced is "how to collect children at a particular place every day." Children are shy by

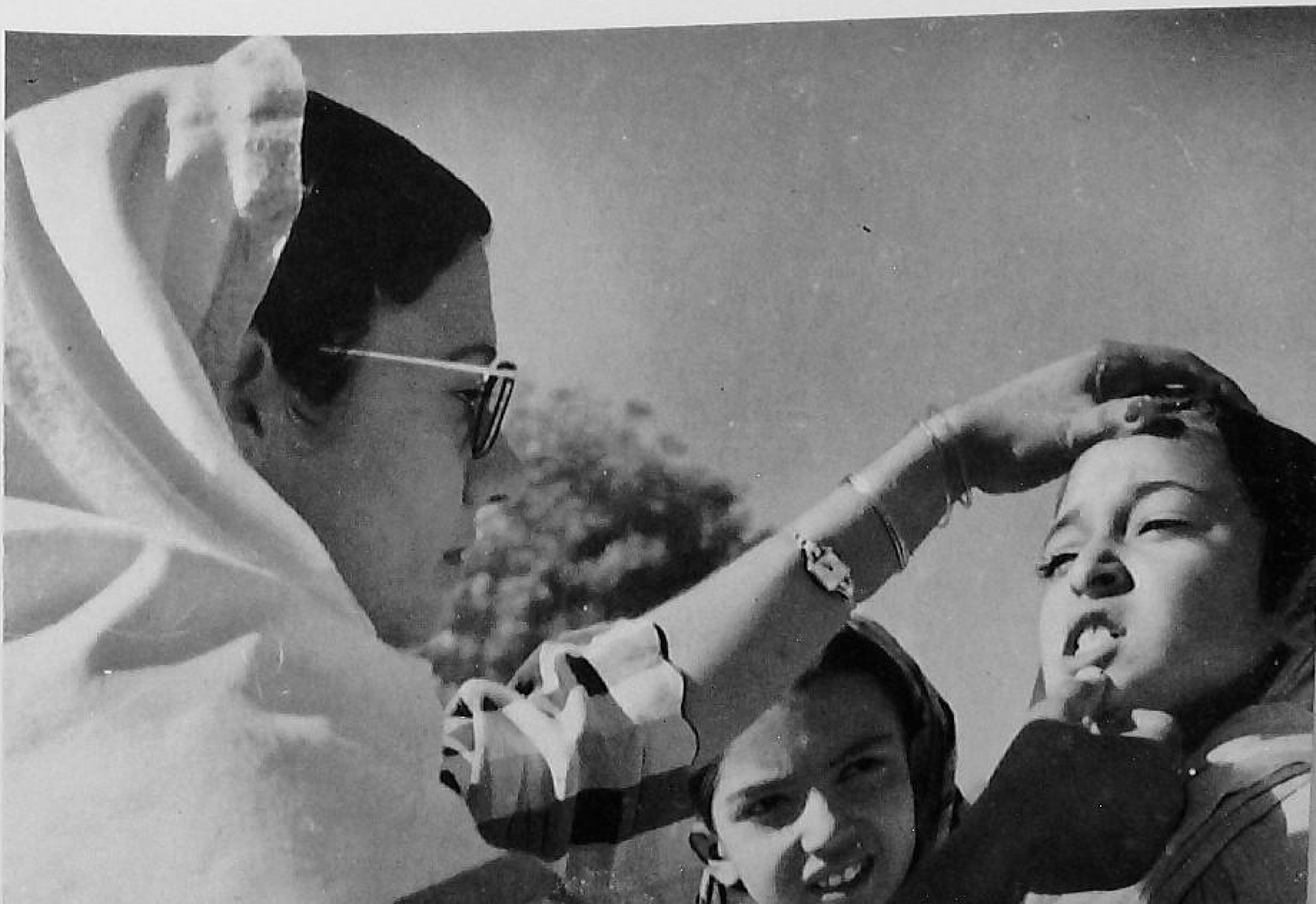
nature. Even if they come one day out of curiosity they may remain away afterwards. The person incharge of the Centre would have to be of winsome nature, and he would have to make himself loved by the little ones. He should also have a few interesting things around in the Centre so that children are attracted to it voluntarily. The "View Master", which shows interesting pictures, has proved an object of great interest wherever it has been tried for the purpose. It costs only about Rs. 25. Similarly, cheap musical instruments and mouth organs are highly useful for attracting children. There are numerous other simple and inexpensive things which appeal strongly to the child. The organizer should have these at the Centre, and make these available to children when they come. Of course, these should be taken back when they leave the Centre. Gradually the little ones would flock to the Centre at the appointed time every day, and the stage would be set for the next step.

When the organizer grows confident about regular visits of the children to the Centre, he should introduce selected village games involving minimum expenditure on equipment. Some of the indigenous games are very good and cost nothing. These are: *Khoe, Totra*, Cock fighting, *Kabbadi, Gidda, Keekli*, different kinds of races etc. The organizer would be able to think of other suitable games also which help in the building of character and training for leadership. The games selected should be played daily for several weeks without introducing changes. The organizer should be loveable, but he should take care not to identify himself entirely with his young friends. He has to be like an elder to them so that they can look up to him with respect and love for guidance.

When the ground has been prepared thus far, it is desirable to introduce elementary education. Country songs of the area should first be popularised. This would create interest for group performances, and remove shyness. A meeting may be held every day before the close of the daily programme. In this meeting every child should be encouraged to express himself in whatever way he likes to. Solo and chorus singing would make these meetings very lively. The educative programme may be expanded week after week, and story telling, talks, skits, songs on development work etc., may be introduced by stages. Side by side, games and exercises of the newer type should be popularised. Gymnastics, dancing, football,

Learning to spin in the Bal-sabha

One of the regular medical check-ups of children



volleyball, basket-ball, etc., would be avidly taken to by the children, The Social Education Organizers in collaboration with the Village Level Workers would be able to give proper direction to these children's programmes.

The *Bal Sabha* is now at an advanced stage of development. The organizer should pay particular attention now to the habits of children who come to it every day. He should inculcate in them love for cleanliness, regularity, truthfulness, honesty, and other social virtues. Good manners should also be taught.

The time is now ripe for having a regular children's park. A suitable piece of land for the purpose should be secured from the Panchayat. With the help of the organizer children should clear the ground, and plant a hedge around it which would serve as boundary. Flower beds and grassy plots should be raised at selected places. A permanent *Akhara* should be prepared on one side of the park for wrestling, *Kabaddi*, and gymnastics. All this should be done by children themselves. They should select a leader or a number of leaders from among themselves to look after the park as it grows. These leaders would be responsible for keeping the park in orderly condition and ensuring that the plants are watered properly. This would not only create love for the park, which children would now regard as their own, but would also foster leadership and sense of dignity of labour.

Variety programmes should be arranged regularly. In such programmes camp fires at night, dramas and skits, singing, dances, short speeches, debates, etc., should be included. Occasional community dinners should also be organised.

The *Bal Sabha* would now be a regular institution, and would be regarded by children as their own creation.

CHAPTER 39

SOCIAL EDUCATION

Social Education implies a comprehensive programme of community uplift through broadening of community outlook. The Social Education Organizers have to help people to overcome inertia, and handicaps imposed by isolation of villages from the centres of knowledge. Their duties are of a comprehensive nature, for they have to be educators, guides, and preceptors. They have to take up adult education on mass scale on the one hand, and to foster the habit of community thinking, and community action, on the other. The programme of adult education embraces a wide field of activity. The people have to be made literate, and they have to be invested with an outlook which would pave way for the self-regenerating work which constitutes the community Development Programme. Broadly, its objectives are as follows:

(*i*) Literacy ;
(*ii*) Acquiring of skills ;
(*iii*) Acquiring knowledge ;
(*iv*) Development of understanding ;
(*v*) Organising for cooperative action.

The individual must be prepared by degrees to participate in the wider national life more effectively. Fostering co-operative efforts help realise this. There should be the closest integration of the various activities conducted in a locality so that the forces of friendship and goodwill released by one activity can be utilised for making others successful.

Community Centre

The activity should have for its focal point a community centre, which should be developed assiduously. Community centres are a very essential part of Social Education. After the interest of adults has been stimulated, a programme of literacy should be initiated. After progress has been made with the literacy programme general knowledge on all aspects of life should be imparted through ways that would interest the villagers. Side by side with all this, recreative

A Dai training class

programmes should be initiated. *Bhajans, Kirtans,* dramas, folk songs, folk dances, film shows, sports etc. should be organised intelligently. This should be followed by the setting up of clubs.

The duties of Social Education Organizers are as below:

Duties of Social Education Organisers

I. To arrange programmes of participation by the rural population in the development programmes under the Community Projects and under the Five-Year Plan, such as, agriculture, village industries, sanitation, health and general village improvement.

II. (*a*) To arrange educational programmes aimed at removal of illiteracy, promotion of health education and education in citizenship and, as far as possible, to carry out this programme through demonstrations and actual life experiences;

(*b*) To arrange for training of teachers in literacy and post literacy work;

(*c*) To organise examinations in literacy and citizenship subjects, as and when prescribed.

III. (*a*) To organise follow-up activities with a view to preventing relapse into illiteracy and ignorance, such as, writing on wall paper, editing local news bulletin, setting up rural circulating libraries etc.;

(*b*) To distribute educational material, such as, charts, news letters, wall news papers, pamphlets etc. through an organised library service or otherwise where no such service exists.

IV. (*a*) To organise cultural and recreational activities, such as, folk dances, folk dramas, *kathas, kirtans, bhajans,* exhibitions and *melas*;

(*b*) To utilise all opportunities of popular assemblies, such as, fairs and festivals for propagating right ideals of citizenship and work through lectures, demonstrations etc.;

(*c*) To organise social types of physical welfare activities, games, sports, *akharas* etc.

V. (*a*) To organise youth welfare, women's welfare, and child welfare activities.

(*b*) To organise youth, women and children in groups and clubs and to provide useful projects in which youths, and women organisations could participate in furtherance of the programmes of community projects and the Five Year Plan.

(*c*) To stimulate local leadership and to utilise it where it exists ; to develop leadership, and to train village people for leadership.

VI. (*a*) To be in charge of the mobile unit for arranging cinema shows.

(*b*) To promote the use of audio-visual media through films, film strips, lantern slides, projection material, posters, gramophone records, exhibitions, etc.

(*c*) To arrange for proper utilisation of radio sets by organising radio listening groups.

VII. (*a*) To correlate Social Education with Primary and Basic Education, and to associate in their spread and improvement of standards.

(*b*) To extend services of the schools to the community and thus link up the Primary and Basic Education with Social Education.

VIII. To organise community centres and gradually to develop them as focal centres of social services and other amenities for the community.

IX. To help in coordinating the activities of other departments and sections with the activities of Social Education.

X. To organise voluntary agencies in the rural areas at different levels for carrying out Social Education activities on self-help basis.

XI. To maintain necessary records and registers, as directed from time to time.

XII. To submit reports on the progress of Social Education and other activities entrusted to him.

XIII. To direct, supervise and control the work of village level workers in the field of Social Education.

XIV. To organise office administration where a separate office exists for him.

Seminars on Social Education

With a view to giving fillip to the work of Social Education Organizers and enabling the other project staff to get better understanding of their work two seminars on social education have been organised in the State. These were held from the 25th to the 26th February 1954, at Nilokheri and from the 10th to 15th October, 1954, at Andretta in Kangra Valley, and were attended by Social Education Organizers, Project/Block Officers, and special invitees.

At these seminars the problems of Social Education Organizers were also reviewed carefully. The agenda along with recommendation of these seminars are given below:

FIRST SEMINAR

Item I of Agenda

Concept of Social Education

(*a*) Whether there is a clear understanding of the concept of Social Education ?

(*b*) Whether duties of Social Education Organisers are clearly defined. Duties at present entrusted to them ?

(*c*) Desirability of laying down a uniform pattern of work, and employing Social Education Organisers exclusively for Social Education work.

Recommendations

(*a*) It was recognised that many members of the project staff did not fully grasp the significance of Social Education Programme. Excessive result-mindedness tended to drive into the background the end-objective of Social Education which is the regeneration and development of the villagers. It was, therefore, recommended that the concept of social education should be given definiteness and made understood in its entirety by holding meetings in project areas.

(*b*) There was no difference of opinion in regard to the question whether duties of Social Education Organizers were clearly defined. The duties entrusted to them are according to the prescribed job chart.

(*c*) It was held that no uniform pattern of work could be laid down for Social Education Organizers. It was also recognised that there are no rigid confines within which the duties of Social Education Organizers lie. They have to create mass enthusiasm among the villagers.

Item 2 of Agenda

Evaluation of the work of Social Education Organisers

(*a*) Whether it is possible to lay down broad targets of work for Social Education Organisers ?

(*b*) Standardising forms of registers and reports which Social Education Organisers may be required to maintain.

Recommendations

(*a*) It was felt that in respect of the following aspects of work broad targets could be fixed:

I. **Recreational Activities**
- (*a*) Community Centres.
- (*b*) *Sangit* and *Kavi Darbars*.
- (*c*) Dramas.
- (*d*) Use of other Audio-visual Aids.
- (*e*) Melas.

II. **Literacy Programme**
- (*a*) Literacy Centres.
- (*b*) Training of Adult Education Teachers.
- (*c*) Follow-up Activities.

III. **Organizing Clubs etc.**
- (*a*) Young Farmers' Clubs.
- (*b*) Women's Organizations.
- (*c*) Bal Sabhas.
- (*d*) Training Camps.

It was, however, decided to discourage excessive result-mindedness in the field of social education. Some of the most important aspects of work in this field defy attempts at concrete appraisal. For instance, the question of creating new outlook among the masses, and of developing character, which are the most vital parts of the programme, cannot be approached in a spirit of statistical appraisal.

(*b*) Three types of registers were considered necessary for general adoption by Social Education Organisers. One was the "register of recreational activities", another "register for literacy work", and the third "register for co-ordination work done by Social Education Organizers".

Item 3 of Agenda

Technical Requirements of Social Education Organisers

(*a*) Whether the literature normally available to Social Education Organisers covers all their problems in the field ?

(*b*) The need for having a comprehensive practical hand-book on Social Education, dealing with the special problems of social uplift in the State, as distinguished from the precepts contained in text books.

(*c*) Whether adequate primers and other equipment are available for literacy work ?

(*d*) Use of magic lanterns, cameras, and projectors by Social Education Organisers for furtherance of their programme.

(*e*) Any other equipment.

Recommendations

(*a*) It was recommended that the Community Projects Administration should send all literature produced on community development work to Project Executive Officers direct. It was also recommended that Community Projects Administration should be requested to produce literature in Punjabi dialect also so that the Punjabi speaking people in the State could benefit from it.

(*b*) It was decided that there was need for a comprehensive handbook on Social Education.

(*c*) The need for having standard Primers, both in Punjabi and Hindi, was recognised. Committees were appointed to review the available Primers in Punjabi and Hindi, and to suggest a suitable one for general adoption under the Literacy Programme.

It was felt that the Adult Literacy Centres are not properly equipped. There is acute shortage of floor covering and lamps.

(*d*) There was unanimous agreement with regard to the necessity of popularising the use of magic lanterns, cameras, and projectors by Social Education Organisers for the furtherance of their programme.

Movie projectors should be supplied to Social Education Organisers in preference to magic lanterns.

Item 4 of Agenda

Adult Literacy

(*a*) Organisation of literacy classes.
(*b*) Standardising literacy courses.
(*c*) Award of certificates to trainees on successful completion of literacy courses.
(*d*) Organising follow-up activities, and education in citizenship.
(*e*) Imparting general knowledge through literacy programme.
(*f*) Organising short-term training for primary school teachers.

Recommendations

(*a*) To secure greater measure of interest of the Gram Sewaks in the Literacy Programme, it was re-emphasised that Social Education activities should be included in the proformas in which they have to send their monthly reports.

(*b*) The need for standardising literacy courses was recognised.

(*c*) It was suggested that Literacy Certificates should be signed by the Project Executive Officer under the stamp of Development Commissioner.

(*d*) The Gram Sewaks should be imparted additional training of two months and they should attend to the post literacy requirements of the villagers.

(*e*) For imparting general knowledge it is necessary that officials of different development departments should participate in the literacy programme while on visit to the villages.

(*f*) Organisation of short term courses for teachers is very essential, and it should be made obligatory for village teachers to attend these.

They further recommended that these certificates should be awarded ordinarily in *Kisan Melas*, and distributed by some prominent person. Cash prizes should be given to those standing first and second in the order of merit. The recommendation was accepted. It was pointed out in this connection that there was great need of standardising the tests, on passing which literacy certificates are to be distributed. Generally the qualitative aspect of the literacy programme is sacrificed to the desire of showing impressive results.

Item 5 of Agenda

Cultural Work of Social Education Organisers

(*a*) Development of drama as an institution of rural up-lift.

(*b*) Introducing special dance, music, and poetical features, which may create a proper climate of enthusiasm for development work.

(*c*) Holding of *melas* and exhibitions.

(*d*) Opening of libraries and reading rooms. Organisation of small mobile libraries.

(*e*) Creation of aesthetic out-look in villages by instructing villagers in the art of house decoration, organising healthy club life, and holding "Ghar Singhar Utsavs". Supply of good prints of photographs and paintings to villagers, opening of small decent cafeteria, and introduction of modern crockery to bring about useful changes in living habits.

(*f*) Organising village sports—particular games suited to different areas. How to encourage local sports ?

(g) Organising 4-H clubs in villages.

(*h*) Steps necessary for fighting social evils, taboos, superstitions etc.

Recommendations

(*a*) A committee was appointed to select suitable dramas which may be popularised in community areas. The committee would also advise on the selection of curtains and putting up of stage. It was pointed out that the stage and curtains generally used at present leave much to be desired. Curtains should mostly be in simple primary colours and should not have ugly pattern work on them.

(*b*) It was pointed out that folk dances particularly the Bhangra dance, lacked in refinement. There was a suggestion that some measure of refinement should be introduced in these, and uniforms prescribed for the purpose. In this connection, however, it was pointed out that to impose our norms of refinement on folk expressions of emotions would be very wrong. Likewise, by prescribing standard uniforms, the folk dances would be made insipid so far as rural gatherings were concerned.

(*c*) It was recommended that *Melas* should be organised in each Development Block seasonaly, instead of every month.

(*d*) The question of fostering aesthetic outlook among the villagers was discussed at length. The question has two aspects: to promote habits of cleaner living by turning to best account the material available in villages, and to introduce such changes as may be called for in the context of development in the consumption pattern of villages. It would be necessary to popularise simple beautiful articles of utility, whether originating from villages or coming from outside. Careful study should be made of articles of utility which could be introduced in villages with advantage. It was decided to supply inexpensive photographic prints to rural areas creating love for fine arts. The need for encouraging planting of flowering plants was stressed. It was also recommended that models of good villages and houses should be got prepared, and displayed in rural areas.

(*e*) It was recommended that side by side indigenous village games some suitable modern games like foot-ball, volley ball, basket ball, deck-tennis etc. should also be encouraged.

(*f*) It was felt that 4-H clubs could come into existence only through slow growth. Club life was practically non-existent in our villages. It would have to be created and fostered in an unpretentious manner so that it can take root in the countryside.

(*g*) It was recognised that social evils, superstitions, etc. can be fought best if intelligent study of these is made. It was suggested that material should be collected in the community areas on social evils peculiar to them. Later, suitable campaigns should be devised to eradicate these.

Item 6 of Agenda

Socio-economic surveys

(*a*) Need of survey for collecting material on local social conditions and culture, and fostering indigenous culture. Necessity of collecting material on folk lores, folk arts, festivals, ceremonies, social conventions and taboos, customs, etc.

(*b*) Conducting *ad hoc* social surveys for gauging from time to time improvements brought about in living conditions as a result of development schemes.

Recommendations

It was decided not to hold the above Surveys as there was no time to spare for these.

Item 7 of Agenda

Technique of village work for Social Education Organizers

(*a*) Whether Social Education Organisers know the use of camera, magic lantern, and projector. Necessity of supplying these to them ?

(*b*) Compiling songs and poems on community development work.

(*c*) The part played by *Bhajan Mandlies* and *kirtan* parties etc. in Social Education Programme. How to organise these extensively ?

(*d*) Special methods for approaching village women.

Recommendations

(*a*) Social Organisers are not acquainted with the use of magic lantern and projector, though some of them can use camera. They should be given training to handle all these things.

(*b*) Songs and poems on community work should be compiled.

(*c*) *Bhajan Mandlies* and *Kirtan* parties have played an important role in educating people in community work. These *mandlies* should find out suitable persons for *bhajans* in the villages in the Projects. They shall provide healthy recreation for masses, and infuse spirit of team work. Persons of outstanding talent should be encouraged by giving prizes etc.

(*d*) Efforts by batches of women to organise *kirtan*, *katha*, and *satsang* among village women have proved very successful. Organizing Community lunches and baby shows can also be useful.

Item 8 of Agenda

Social Education Organizers and Rural Information Service

(*a*) Devising ways for using Social Education Organisers as an agency for disseminating knowledge required by villagers in their daily life on social subjects.

(*b*) How could Social Education Organisers help publicity work ?

(*c*) Maintenance of Information Centres at Project Headquarters, and organising a News Service for the benefit of rural areas. The journals issued by the Publicity Department have a defined scope, and cannot be made use of for disseminating technical knowledge, or for dealing with specific problems of rural development work etc.; hence the need for a distinct news bulletin service.

Recommendations

(*a*) It was recognised that Social Education Organisers could serve as a very useful agency for disseminating knowledge required by villagers in their daily life on social subjects.

(*b*) It was felt that they could help in publicity work by writing feature articles and sending material for publication in government journals. It was recommended that Social Education Organisers should be called upon to take better interest in this work and to send their articles etc. to Administrative Intelligence Officer for publicity.

(*c*) There was no difference of opinion with regard to the desirability of having a news-service for the benefit of rural areas. Social Education Organisers could organise a very useful chain of rural information centre, disseminating all important information needed by the villagers.

SECOND SEMINAR

Item 1 of Agenda

Implementation of Recommendations made at the First Seminar on Social Education held at Nilokheri in February, 1954.

(*a*) Items on which action was to be taken at Headquarters' level :

(*i*) Fixation of targets in respect of literacy programme and recreational activities.

(*ii*) Inclusion of items of Social Education in the proforma of monthly progress report prescribed for Village Level Workers.

(*iii*) Selection of standard Primers both in Punjabi and Hindi for literacy work.

(*iv*) Issue of Adult Literacy certificates by the Director of Public Instruction.

(*v*) Supply of good prints of photographs and pictures to community areas.

(*vi*) Collection of material on social evils in development areas.

(*vii*) Collection of folk songs and development songs.

Action has been taken on items, (*i*), (*ii*), (*iv*), (*v*) and (*vii*).

(*b*) Items on which action was to be taken at Project/Block level:

(*i*) Holding of meetings of Community Staff to make the concept of Social Education, and the role of Social Education Organizer understood.

(*ii*) To confine the duties of Social Education Organizers to their own sphere of work.

(*iii*) Provision of adequate office amenities.

(*iv*) Provision of proper transport facilities to Social Education Organizers.

(*v*) Association of Social Education Organizers with Project Advisory Committees.

(*vi*) Submission of monthly notes on progress of Social Education work by Social Education Organizers to Project/Block Officers.

(*vii*) Project/Block Development Officers to consult Social Education Organizers at the time of making entries in the Character Rolls of Village Level Workers.

(*viii*) Proper equipment for Adult Literacy Centres.

(*ix*) Celebration of Community Project Works in which special attention should be paid to Social Education work.

(x) Organisation of short term courses in Social Education for village teachers.

Project/Block Officers have intimated that action is being taken on the above items.

Item 2 Of Agenda

Training of Social Education Organizers

(a) Whether the syllabus of the training course needs modification ?

(b) Whether special instruction in the use of audio-visual aids is considered necessary ?

(c) Whether the training programme for Lady Social Education Organisers is adequate ?

Recommendations

(a) There is need for making the syllabus of the training course more practical. At present there is little conscious co-ordination of the training course with the realities which Social Education Organizers have to face in the field. The training centre should have a clear picture of the work which Social Education Organizers have to do in development areas, and it should plan the syllabus of training in the light of this. Besides, special instruction should be provided in office work, first aid, home economics, and organisation of recreational activities.

(b) Adequate training in audio-visual techniques has not been provided. Special training in the use of audio-visual aids should be provided.

(c) The training programme does not cover all the requirements of lady social education organisers. Lectures on social problems of women should be included in the general syllabus, and special lectures on child care, mid-wifery, home-nursing, family planning etc. should be arranged for Lady Social Education Organisers.

Item 3 Of Agenda

Adult Literacy

(i) What should be the nature and duration of short term courses for village teachers who have to conduct literacy courses ?

(*ii*) Standardisation of duration and syllabus of literacy courses.

(*iii*) Standardisation of teaching methods.

(*iv*) Preparation of primers, readers, posters etc.

Recommendations

(*i*) Short one-week training courses should be organised for village teachers who have to conduct literacy classes. Such courses should be organised at regular intervals. The syllabus of these should include: Adult Psychology; the method of literacy already adopted by the Social Education Organizers of the area; framing model lessons on the topics covered in the syllabus for adult classes; organisation of recreational activities; organisation of community centres and libraries; and evolving follow-up techniques.

(*ii*) There should be only two literacy courses in a year. These should be so timed as to synchronise with the leisure periods of the villagers. The duration of each course should be of 4 to 5 months. The syllabus prepared by the Ministry of Education, Government of India, is quite comprehensive. However, it can be modified slightly to suit local conditions. All Social Education Organizers would submit to the Development Commissioner separately a draft syllabus, which they think useful for their areas.

(*iii*) The traditional method of teaching is considered quite suitable. No hasty change should be introduced. New primers according to new methods may be written and tried in small areas before these are adopted for all the development areas. Social Education Organizers, if asked, would write such primers and submit these to Government.

(*iv*) A committee may be appointed for the selection of suitable primers. This committee would advise on the preparation of new primers. Posters on development work which are generally available in the market are of poor quality. Attractive posters should be specially got prepared.

Item 4 of Agenda

Audio-visual Aids for Social Education Programme

(*i*) Nature of audio-visual aids available to Social Education Organisers and whether these are satisfactory.

(*ii*) Suggestions about provision of more equipment and material.

(*iii*) Planning mobile exhibitions.

(*iv*) Equipping Community Centres with listening sets, posters, models, maps etc.

Recommendations

(*i*) and (*ii*) The following audio-visual equipment is available to Social Education Organizers in the Community Projects: Film projectors; film strip projectors; epidiascope; camera (of ordinary nature); amplifier; generator; gramophone with records.

A separate production unit should be set up at the State Headquarters for the production of material needed by Social Education Organizers, *e.g.*, posters, flannel graphs, flash cards, film-strips, models, etc.

(*iii*) Mobile exhibitions are considered very necessary. Arrangements should be made for providing material for these exhibitions. Arrangements for this should be made at the State Headquarter's level.

Pick-ups should be made available to Social Education Organizers for carrying the exhibits from place to place within their areas.

Item 5 of Agenda

Cultural Work

(*i*) Programme for "*Ghar Singhar Utsavs*", and other *melas.*

(*ii*) Study of social evils.

(*iii*) Suggestions for fostering local arts and crafts.

(*iv*) Suggestions about development of drama as an institution of rural uplift.

(*v*) Whether Young Farmers' Clubs are taking roots? Suggestions about making these more popular and useful.

(*vi*) To what extent are *Stri Sabhas* popular? How can these be turned to best account?

(*vii*) Sports for Young Farmers' Clubs and *Stri Sabhas.*

Recommendations

(*i*) The *Ghar-Singhar Utsavs* should be observed during the days between the *Dussehra* and *Diwali*. Regarding other *melas*, it would be good if these are arranged at the time of seasonal festivals, or on important national days. Special *melas* for children and women should also be organised.

Prizes should be given during the *mela* days for outstanding activities. Side by side, suitable exhibitions should be arranged to provide visual education.

(*ii*) Special study should be made of the social evils obtaining in each development areas. A broad synopsis of the field to be covered should be sent to Social Education Organizers, who would write their reports within a month's time.

After material is collected on social evils, campaigns at State level should be devised for fighting these.

(*iii*) Co-operative societies should be formed to provide assistance to local artists and craftsmen in improving their standard and level of production.

(*iv*) Local drama parties should be encouraged by providing assistance to them in the form of technical guidance and material.

A committee should be formed to select and write dramas and to produce a manual on stage-work.

(*v*) Young Farmers' Clubs have not taken roots so far. At present even the best of these are merely sports clubs. A clear and definite outline of their shape and objectives should be drawn up, and whatever material is needed to equip these should be supplied. These clubs should become components of a sound youth movement in rural areas.

(*vi*) Only a start has been made so far in organising *Stri Sabhas*. Suitable literature, photographs, and pictures should be provided to these *sabhas*. Besides, arrangements should be made for providing instruction to the *Stri Sabhas* in home crafts, child welfare, family planning etc. Film shows would prove highly useful. Special games suitable for women should also be popularised and competitions in physical fitness should be organised.

(*vii*) Local sports should be encouraged. For men, *Kabaddi*, tug of war, races, wrestling, gymnastics, foot-ball, volley-ball, and hockey should generally be considered appropriate games. For women, skipping, sewing, net-ball, dancing etc. would be very good.

Item 6 of Agenda

Welfare Work among Women

(*i*) Methods for approaching village women and overcoming their conservatism.

(*ii*) Suggestions about teaching personal hygiene to women.

(*iii*) Special crafts for women.

Recommendations

(*i*) Approach to village women should be made through individual contact as well as through group gatherings. Wives of Extension staff and other interested ladies of the area should be organised into small bodies for doing up-lift work among the rural women. They should be provided with facilities for launching special programmes. *Istri Melas* and children's festivals would help in associating village women with the development programme. Congregational singing, dancing, and staging dramas exclusively for women are other methods of approach. All these activities can be knit together in the form of a programme if *Istri Sabhas* are organised.

(*ii*) Personal hygiene can be taught to women through skits, posters, documentary films, lectures, and group discussions. These means can effectively be made use of by *Istri Sabhas*.

Crafts for women will have to be planned with reference to local conditions and conventions. However, there are certain general crafts like tailoring, knitting, dyeing and calico printing, toy making, embroidery, fruit preservation, etc. which should be promoted in all areas. Arrangements for providing instruction in these would have to be made by Government.

Item 7 of Agenda

Child Welfare

(*i*) Methods for providing simple instruction in eugenics, scientific mother-craft, family planning and child welfare.

(*ii*) Organising baby shows.

(*iii*) Whether Bal Sabhas are popular, and children participate in the sports designed for them?
Suggestions for improvement.

Recommendations

(*i*) The training of lady social educational organizers does not cover eugenics, mother-craft, family planning, and child welfare. Special instructions should be provided at the training centre in these important subjects. For the present, the agency of lady Health Visitors should be made use for spreading knowledge about these Lectures and group discussions should be arranged in *Istri Sabhas*, and suitable literature distributed.

(*ii*) Baby shows should be organised in villages from time to time, and attractive prizes should be awarded to topping childern. A central baby show should be organised at the Project/Block Headquarters once a year, in which prize winners at the local baby shows shou'd participate.

(*iii*) The *Bal Sabhas* are still in their infancy. The village teacher should take greater interest in organising suitable activities for chilc'ren. *Melas* of children should be organised. Special attention should be paid to creating children's parks, and Village Level Workers should be made responsible for ensuring that these parks are actually made use of by the village children.